

ROYAL UNITED SERVICE INSTITUTION.

JUNE, 1912.

SECRETARY'S NOTES.

I.—OFFICERS JOINED.

The following officers joined the Institution during the month of May :—

Major C. E. Higginbotham, Northamptonshire Regiment.
Lieutenant F. Mills, Malay States Volunteer Rifles.
Captain H. C. Smith, Suffolk Regiment.
Major E. H. E. Abadie, D.S.O., 9th Lancers.
Commander H. P. Douglas, R.N.
Major B. C. Green, 14th Bn. The London Regiment (T.F.).
Major J. McC. Steele, Coldstream Guards.
Captain C. W. Wise, 4th Bn. Royal West Surrey Regiment (T.F.).
Major E. Pugh, V.D., late 3rd Bn. Royal Fusiliers.
Second-Lieutenant R. C. H. Woodhouse, Unattached (T.F.).
Captain H. L. Scott, I.A.
Lieutenant R. G. Bowyer, R.N.
Major C. D. Murton, 5th Bn. East Kent Regiment (T.F.).
Lieutenant R. C. Dalglish, R.N.
Lieutenant G. G. Russell, King Edward's Horse, Imperial Yeomanry.

II.—CLOSING OF INSTITUTION BUILDING.

The Council have decided to paint the whole of the interior of the Institution buildings, in the late summer, and in consequence the Institution will be closed to members for five weeks, viz., from Monday, August 12th, to Saturday, September 14th, both days inclusive.

The Museum will be open as usual; and books can be obtained from the Lending Library on written application.

III.—OFFICERS ON THE ACTIVE LISTS.

In answer to several enquiries, officers on the Active Lists are informed that all Essays, Articles, and such other contributions submitted by them, and which it is proposed to publish in the JOURNAL of the Institution, are, previous to insertion, submitted to the Admiralty and War Office respectively, for sanction for publication.

The Secretary begs to inform such officers that in no single instance during the past eight years has such permission been refused.

IV.—NEW MEMBERS.

A form is inserted in this JOURNAL, and will be repeated regularly for the benefit of those officers who may wish to join the Institution. The filling up of the form, and its transmission to the Secretary is all that is necessary in the case of officers appearing in the Official Active Lists. The Council hope that members will circulate the forms. Officers joining after the 1st October in any year are not called upon for any subscription the following year.

V.—ADDITIONS TO THE MUSEUM.

- (6439). A complete set of Mafeking Paper Currency issued under the authority of Colonel R. S. S. Baden-Powell during the siege of that place by the Boers from October 13th, 1899, to May 17th, 1900. The values were £1, 10s., 3s., 2s., and 1s.—Given by Colonel A. W. Money, C.B., General Staff.
- (6440). Water-colour Sketch made in 1853 of a Turkish Fort in the Dardanelles, showing a battery of quaint bronze guns of an early period, with piles of marble shot, which were made out of some of the old ruins of early buildings. Drawn on the spot by Miss Maclean, now Lady Hood of Avalon.—Given by Major H. F. Maclean, Scots Guards.
- (6441). A New Zealand Meri or War Club of bone.
- (6444). Model of H.M.S. "Royal Albert."
 The "Royal Albert," the keel of which was laid down at Woolwich on August 26th, 1842, was originally designed as a sailing line-of-battle ship, but in January, 1852, the order was given to alter her to a screw-ship of the line, and, in consequence, she was lengthened about 14 feet at the stern in order to give space for the propeller. This additional length increased her size by about 246 tons measurement, and her dimensions then were:—Length between perpendiculars, 232 feet 9 inches; length of keel for tonnage, 193 feet 6 inches; breadth, extreme 61 feet; breadth for tonnage, 60 feet 2 inches; breadth moulded, 59 feet 4 inches; and depth in hold, 24 feet 2 inches. Her builders' measurement tonnage was 3,726 tons, and her displacement 5,637 tons. Her engines, built by Messrs. John Penn & Son, on their patent trunk principle, were of 500 nominal horse-power, and 1,805 indicated horse-power.
 She was launched by H. M. Queen Victoria on May 13th, 1854, and it was then the intention that her armament should consist of 131 guns, but this was reduced to 121 guns.
 In the autumn of the same year she was commissioned by Captain Sir Thomas Pasley, with a complement of 1,000 men, and went out to the Black Sea as flagship of Rear-Admiral Sir Edmund Lyons, Bart., G.C.B., before Sevastopol.
 After her Mediterranean commission, she served as flagship of the Channel Squadron, and this was her last sea service, her name disappearing from the "Navy List" in 1884.
 This model, from the original design, given by the Rev. F. C. Lang, Chaplain, R.N., has recently been rigged by Mr. John Smith and Mr. John Preston, both late first-class petty officers, R.N., and now attendants in this Institution.
- (6445). Bugle-Major's Staff of the 2nd Battalion King's African Rifles, presented to that Regiment by Captain and Adjutant W. G. Stonor. The Battalion was disbanded in 1911.—Given by Captain W. G. Stonor, Middlesex Regiment.
- (6446). Two Guidons of the London and Westminster Light Horse Volunteers, which were presented to that corps by the Corporation of the City of London in 1781. The Regiment was raised in 1769, and was finally disbanded in 1829.

- (6447). Drum Banner of the London and Westminster Light Horse Volunteers.
- (6449). A large Chinese Silk Flag, captured by Captain Riordan of the China Field Force, at the taking of the Taku Forts. The Taku Forts were successfully assaulted on August 21st, 1860, by a force of 11,000 British and 7,000 French troops under General Sir Hope Grant.—Given by Captain D. C. L. Orton, Welsh Border Mounted Brigade, Field Ambulance.
- (6450). An Inkstand made from a small shell and four bullets picked up on the field of Inkerman. The Battle of Inkerman was fought on November 5th, 1854.—Given by Lieut.-Colonel H. St. John Mildmay, M.V.O.
- (6451). A small Marble Vase on Stand, made from portions of the dock of Sevastopol in 1856, containing Russian bullets picked up on the heights of Inkerman.—Given by Lieut.-Colonel H. St. John Mildmay, M.V.O.
- (6453). A Coloured Print by R. Dighton, being a representation in caricature of Lieut.-General Macdonald, 1812.—Given by A. M. Philips, Esq.
- (6454). An Indian Cavalry Officer's Sword of about 1850. The blade is marked "Garden," and is of very finely tempered steel.
- (6455). A French Infantry Officer's Sword of about 1800, with brass hilt and finely tempered blade.
- (6456). An Officer's Sword bearing the arms of the Argentine Republic. It has a long straight blade with deep groove, and "Viva la Confederación, Argentina" marked on it.
- (6457). A curved Indian Sword with bifurcated point. On the blade is an inscription in Persian.
- (6458). A Nepaulese Sword with jade handle. The blade is slightly grooved and of considerable width.
- (6459). A Mahratta Dagger; the handle is richly embossed with silver.
- (6460). An Indian Battle-axe, inlaid with silver.
- (6461). A Belgian percussion-lock Carbine, with a long revolving bayonet; it was used by the Belgian Gendarmerie.
- (6462). An Italian needle-fire Rifle, Cascana's system, with straight sword bayonet.
- (6463). A Swiss Government rim-fire Rifle (Amker-Milbank).
- (6464). Two Canvas Knapsacks of the 10th Regiment of North British Militia (now the 3rd Battalion The Royal Scots), of about 1795.—Given by His Grace, the Duke of Buccleuch, K.G., K.T.
- (6466). Knapsack Ornament (General Service) of the time of George III.—Given by Lieut.-Colonel A. St. L.Glyn.
- (6467). A Chinese Weapon, combining a pistol with percussion lock, and a Da blade concealed in the stock, which latter is exposed by drawing the barrel from the stock when the trigger is at full cock. It was brought from the frontier between the Shan states and Yunnan.

PRINCIPAL ADDITIONS TO LIBRARY.

May, 1912.

- The Japanese in Manchuria, 1904.** By Colonel E. L. V. Cordonnier, French Army. Translated by Capt. C. F. Atkinson. 8vo. 7s. 6d. (Presented by publishers). (Hugh Rees, Ltd.). London, 1912.
- The Journal of Lieutenant Hugh Gordon, 1st Foot (Royal Scots), April 26th, 1814—February 20th, 1816.** Crown 8vo. (Presented by Mr. Hugh Gordon). (Privately printed). Aberdeen, 1912.
- Marine and Naval Boilers.** By Lieut.-Commander Frank Lyon, U.S.N., and Lieut.-Commander A. W. Hinds, U.S.N. 8vo. 12s. 6d. Illustrated. (Presented by U.S. Naval Institute). (U.S. Naval Institute). Annapolis, 1912.
- Nautical Phraseology in English, French, Spanish and German, for use at the U.S. Naval Academy.** Crown 8vo. (Presented by U.S. Naval Institute). (U.S. Naval Institute). Annapolis, 1911.
- Some Things we have Remembered—Samuel Thornton, Admiral, 1797-1859, Percy Melville Thornton, 1841-1911.** By Percy Melville Thornton. 8vo. 7s. 6d. (Presented by the author). (Longmans, Green & Co.). London, 1912.
- The Mechanics of the Aeroplane.** By Capt. Duchêne. Translated from the French by John H. Ledeboer and T. O'B. Hubbard. 8vo. 7s. 6d. (Presented by the publishers). (Longmans, Green & Co.). London, 1912.
- The Russo-Japanese War, 1904-1905. Vol. 1. Up to and including the Battle of Liao-Yang.** By Colonel C. Ross. 8vo. 10s. 6d. (Presented by publishers). (Macmillan & Co., Ltd.). London, 1912.
- Pitt and Napoleon.—Essays and Letters.** By J. Holland Rose. 8vo. 10s. 6d. (G. Bell & Sons, Ltd.). London, 1912.
- My Life at Sea.** By Commander W. Caius Crutchley. 8vo. 7s. 6d. Illustrated. (Chapman & Hall, Ltd.). London, 1912.
- Napoleon's Campaigns in Italy, 1796-1797 and 1800.** By Lieut.-Colonel R. G. Burton. Crown 8vo. 5s. (George Allen & Co., Ltd.). London, 1912.
- British Battles.—Waterloo.** By Hilaire Belloc. Crown 8vo. 1s. (Stephen Swift & Co., Ltd.). London, 1912.
- Geschichte Ferdinands Herzogs von Braunschweig-Lüneburg.** By Lieut.-Col. J. Mauvillon. 2 Vols. 12mo. 6s. 6d. (Dyktische Buchhandlung). Leipzig, 1794.
- Problems of the Pacific.** By Frank Fox. 8vo. 7s. 6d. (Presented by the publishers). (Williams & Norgate). London, 1912.
- Practical Methods of Meat Inspection for Regular and Territorial Regimental Officers.** By Major C. D. Christopher, A.S.C. Crown 8vo. 6d. (Presented by the author). (G. Toulmin & Sons, Ltd.). Preston, 1912.
- Travaux Tactics.—Thèmes et Solutions.** 2 Vols. 8vo. 7s. 2d. (R. Chapelot et Cie). Paris, 1909-11.
- Procédés de Combat du Bataillon et de la Compagnie d'Infanterie.** By Commandant Stirn. 8vo. 3s. (Berger-Levrault). Paris, 1911.
- Military History for Examinations.—Questions on the Napoleonic Campaign, Ulm and Austerlitz, 1805.** By Lieut.-Col. H. M. E. Brunker. Crown 8vo. 1s. (Presented by the publishers). (Forster, Groom & Co.). London, 1912.
- War and the Private Citizen.—Studies in International Law.** By A. Pearce Higgins. 8vo. 5s. (Presented by the publishers). (P. S. King & Son). London, 1912.

THE JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION.

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[Authors alone are responsible for the contents of their respective Papers.]

AIRCRAFT FOR SEA SERVICE.

By LIEUT. F. L. M. BOOTHBY, R.N.

On Wednesday, 17th April, 1912.

Rear-Admiral A. H. S. BACON, C.V.O., D.S.O., R.N., in the Chair.

INTRODUCTION.

UP to the present the science of aeronautics, as a whole, has suffered from the fact that the two main schools of thought—I mean the aeroplane and airship schools—have not worked together in a spirit of mutual co-operation, but have been at pains to decry the merits of the one type and to praise their own particular favourite, as might well be expected when vessels so different in design and functions have to be discussed. Experts are apt to take a one-sided view of the capabilities of their favourite, to the disadvantage of its rivals. The result is that both branches suffer more from the criticism of their opponents than they gain from the advocacy of their friends. Looking at the matter from the point of view of utility to the Navy, both types have advantages for service at sea—one for comparatively short flights and the other for more extended cruises, whilst there is a large region where their functions overlap. It is, therefore, as an advocate of both types that I venture to address you to-day. I have been so fortunate as to be able to watch the development of the aeroplane since the days when Mr. Roe designed the first British aeroplane, and since the first Wright machines appeared at Sheppey. I have also been in a position to watch the building of an airship. The fact that opportunities of being intimately acquainted with both types have not been given to many officers is my only excuse for delivering this lecture. There are a large number of officers more qualified to speak on aeroplanes and airships than I am, and they will, I trust, deal gently with me when we come to the discussion if I do not

credit their particular type of aircraft with its full capabilities. Before discussing the specific uses of aircraft, let us examine the performances we may reasonably expect from modern types. I am assuming throughout that all aircraft engines consume .71 lbs. of petrol and oil per horse power hour.

AEROPLANES.

I think it will be generally agreed that a likely winner of the military competition will be a machine of about 70 h.p., and a speed of 70 miles per hour. If this is so, it will be able to carry petrol and oil for $4\frac{1}{2}$ hours, and 350 lbs. in addition, according to the conditions of the competition. Floats for Naval Aeroplanes need weigh no more than a landing chassis, so that this type of machine will be equally suitable for sea service. There is, therefore, the 350 lbs. weight to veer and haul on. If we put two men weighing 120 lbs. each into the machine, the remainder of the weight can be devoted to fuel and oil, and the machine can remain in the air for 6.7 hours. If, on the other hand, only one man is carried, he can remain up for nine hours. Personally, I do not believe that one man could control an aeroplane for so long a period, navigating and keeping a good look-out as well, certainly not if he were searching for submarines. It is in this direction that a good automatic stability device would prove of value, as, by reducing the work and fatigue of the pilot, one man would be able to scout efficiently for a long period, and so enable the maximum endurance of the machine to be attained. So far, a reliable automatic stability device has not been developed, but is likely to be so in the near future. However, for the present we will assume that the two-man arrangement is a normal one. If, in addition, we fit the very necessary wireless apparatus, with a 30 mile range, we must reduce our possible time in the air, so that, if we say we may expect the constructors to provide us with a two-man twin-control aeroplane capable of a speed of 70 knots for six hours, we shall not be asking too much; but, at the same time, we are not likely to get more at present. The distance this type of aeroplane is capable of covering is 420 miles. Such a machine should be capable of starting from a ship or from the water, and of alighting on the water. It does not seem likely that the aeroplane will be able to alight on a ship except in the finest weather. If there is the slightest wind, eddies are formed around the ship which will make alighting on board dangerous. Any motion on the ship will make matters worse. When an aeroplane is alighting on the ground, it may be struck by a puff of wind which lifts it a few feet, but in this case the pilot alights a few yards further on than he originally intended. In a ship there is no "further on" except in the shape of bulkheads or barbettes. By and by, when we get a gas-engine ship, with a long flush deck, alighting may be possible, but in the meantime an aeroplane that wishes to return to a ship must

alight on the water alongside her and be hoisted in like a picket boat.

The lantern slides show various types of aeroplane floats suitable for use in smooth water. The defect of all flat-bottom floats is that in any sea they hammer badly, and have to be built very strong and heavy to withstand this. An Italian named Forlanini has designed a motor-boat weighing two tons and driven by a 200 h.p. engine which attained a speed of 47 knots. The boat is fitted with hydroplanes, one above the other in the form of a ladder, fore and aft, the size of the hydroplanes decreasing as they get lower. The boat climbs out of the water on these hydroplanes until resting on the lower ones only, and it seems probable that in this direction we must look for the development of aeroplanes capable of starting from and alighting on the water.

THE AIRSHIP.

Engines giving an output of 400 h.p. will drive a well-designed 21 ton airship at the rate of about 47 miles per hour, requiring 3 tons of petrol and oil for the purpose in 24 hours. The equivalent distance through the air is 1,200 miles. By using the formula

$$\text{Speed at } x \text{ power} = \frac{\text{Full Speed}}{\sqrt[3]{\frac{\text{Full Power.}}{x \text{ Power.}}}}$$

we find that at half power she will be able to proceed for 48 hours at 37.3 knots, which is equivalent to a distance of 1,790 miles, or for four days at quarter power, which would give a speed of 29.6 knots, or a distance of 2,841 miles. Three tons is a small amount of fuel for a 21 ton airship to carry. If she were starting on a really long cruise, she could take two tons more than she is able to lift statically, the extra lift being given by the horizontal rudders and engines, assuming that the ship could get up speed by running along the surface of the water; but, of course, full speed could not be attained under these circumstances. Large radius of action in a dirigible, apart from its value in scouting, is highly desirable for the following reasons: In the first place the lift of a dirigible falls off as hydrogen gradually absorbs the air and diffuses—a process known as osmosis, so that a good reserve of buoyancy is desirable. With the materials in vogue a year ago the falling off in lifting power and consequent radius of action was fairly rapid, the gas-bags requiring refilling about once in three weeks. Happily, it seems that in the near future refilling once in three months will be sufficient, improvement in the gas-holding qualities of fabrics recently tested being so great, whilst at the same time their weights have been considerably reduced. Referring to the Report of the Advisory

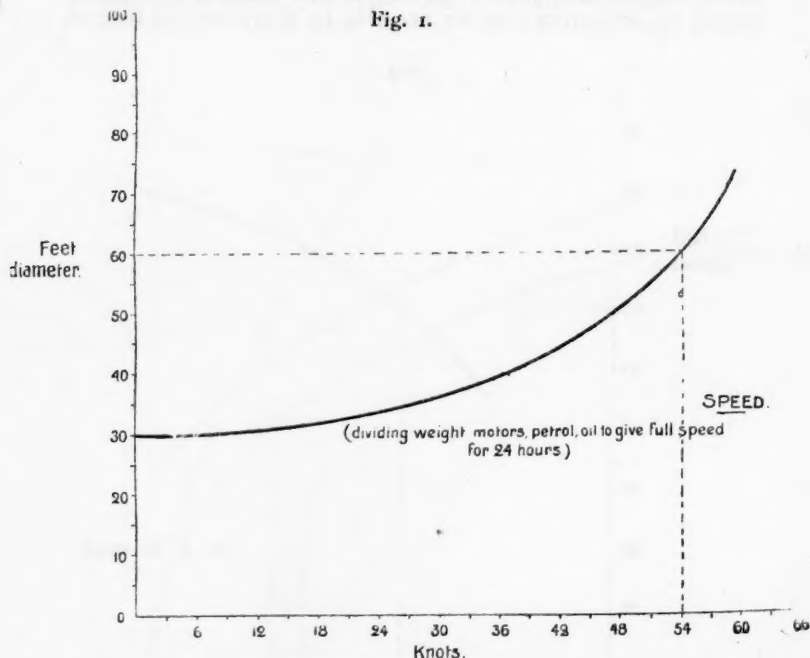
Committee for 1911, we find on page 71 that fabrics have been tested having as low a permeability as .1 litre per square metre per 24 hours, and three samples with less than .6 litre per square metre, compared with a permeability of ten litres per square metre which was considered good a short time ago, whilst the new fabrics do not deteriorate with exposure to any extent, a great contrast to the older types of gas-bag material.

Some figures for the "Adjutant Reau" are interesting. She was filled for over two months before making her well-known cruise of more than 500 miles. During this period she lost only 2 per cent. of lift due to osmosis, whilst the daily leakage was never greater than 1.7 per cent. After being filled for six weeks she was actually able to lift 3,400 kilos of ballast, or 100 kilos more than when she was first filled (this, of course, being due to the action of the barometer), and during the whole period of two months the ballast lifted did not fall below 3,000 kilos. It should be noted that she is not constructed of the very latest type of fabric.

Again, it may be desirable to arm airships with guns to drive off the enemy's aircraft, in case we should wish to look into his ports or approach his fleet, or to prevent his aircraft from obtaining information we wish to conceal. Unless there is a large margin of flotation to draw on, mounting guns or carrying explosives must dangerously reduce the radius of action, especially in bad weather. Considerable radius of action and complete equipment therefore necessitate large airships, and for this reason the non-rigid and semi-rigid are not likely to be of so much use as the rigid for ocean work in the future, their size being limited with the materials at present at our disposal. To realize this, let us take any type of airship and double its length and diameter. We will call the length L and diameter d . The lift increases as $L d^3$, and will, therefore, be eight times as great. The resistance, and therefore the engine power, increases as $L d$, and is therefore four times as great. If, now, we consider the airship as a beam when we double its length, the load remaining the same, and in its same relative position, we double its bending moment. As, however, we have shown that the weight has increased eight times, the bending moment is increased 16 times, or as L^4 . It is therefore obvious that it is useless to contemplate increasing the size of airships and leaving the increased weights lifted in their same relative positions. They must be distributed along the hull, so that the bending moment is not increased. In the ideal airship there would be no bending moment whatever; each section of the ship would take a due proportion of the lift. There is little practical difficulty, especially in the rigid type, in getting this distribution of load, so that the hull weights would increase in proportion to $L d$, or nearly so; that is, would be multiplied by four in this particular instance, whilst gas-bags and outer cover would be increased in the same proportion, so we see that in a rigid airship, all

weights, hull, gas-bags, outer cover, engines for the same speed, all increase in a less proportion than the volume and lift, the exception being the stresses on the transverse frames, due to lift on the top and the load underneath. This might increase as $L d^2$; but by tying down the gas-bags, or, as I consider preferable, by running wires through them, this ratio of increases can be reduced, and certainly need never be exceeded; whilst it should be noted that it is perfectly feasible to carry part of the load, such as petrol tanks, on the top of the airship.

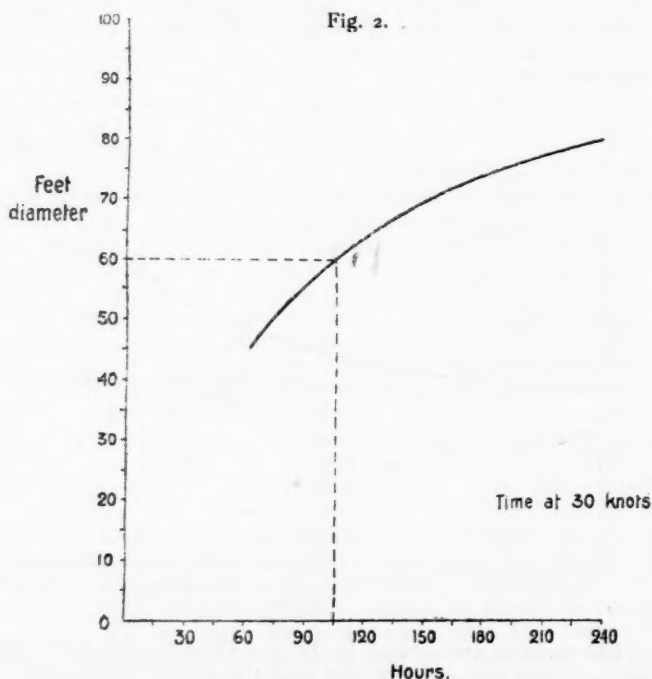
Fig. 1.



The stresses and strains in the non-rigid are the same; but, as we increase the size, we find that the weight of the gas-bag increases at a greater rate than the volume and lift. Doubling the length and diameter as before, the surface, and therefore the weight, of the fabric would increase as $L d$; but, having doubled the diameter (the internal pressure being kept constant), we must also double the thickness of our fabric. This weight will increase as $L d^2$, or at the same rate as volume and lift, but, owing to the increased speeds obtainable from our larger ships (and neglecting any increase necessary for increased bending moment, should there be any), we must increase our internal pressure, which will again require increased thickness and weight of material, so that our gas-bag weight is increasing

at a greater rate than our lift, and a time will come when no increase in size will be of advantage, the actual limit depending upon the material used.

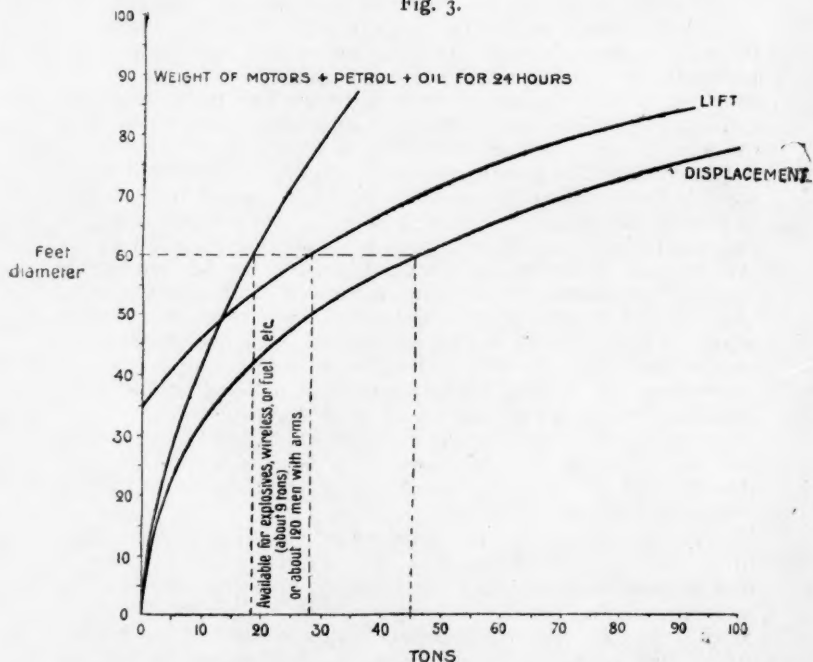
In looking ahead it seems probable that airships will increase in size as other ships have done, and therefore it is advantageous to work on a type which seems capable of great expansion. I have drawn some curves based on the "Schwaben," showing what we might expect from her as we increase her size. I cannot state that they are absolutely accurate, but I think they will be found to be approximately so, assuming that we are able to distribute the load so



as not to increase the bending moment at any point. Count Zeppelin is a patriotic nobleman, who, having designed a magnificent weapon for his country, does not intend to assist any possible enemy by giving away information, so that details about his ships are scarce and difficult to obtain. Taking the details we do know, and the facts obtainable about other ships, we are enabled to draw the rough curves shown, and they are probably accurate within 10 per cent. either way. It is, of course, understood that the length is increased proportionately to the diameter. It will be noted that the figures I suggested,

namely, 400 h.p., giving 47 knots speed for 24 hours, are not borne out by this diagram. This, I am of opinion, is due to the "Schwaben" not being of the most desirable form, either for constructional reasons or because it was found desirable to increase her lift at the expense of speed. Professor Zahm found that least resistance is obtained when the head resistance is equalled by that due to skin friction; this occurs when the bow of the airship is struck at two diameters and the stern at nine, the part in between being parallel. Judging by the photographs, these conditions are not fully satisfied in the "Schwaben," which may account for her requiring greater

Fig. 3.



horse-power for a given speed than anticipated. The necessity for not increasing the bending stresses as we enlarge the ship emphasizes the need of an efficient water recovery plant, so that as the petrol is used it can be replaced by an equivalent weight of water. As theoretically 148 per cent. is recoverable from the exhaust gases, it is probable that there will be little difficulty in recovering 100 per cent. But an even greater proportion than this is desirable to allow of compensating during the day time for ballast lost at night due to the cooling of the gas. It will be seen from the curves that an airship some 60 feet in

diameter will have a speed of 50 miles per hour for 24 hours with a good margin of lift (nine tons), available for extra petrol and oil, guns, explosives, wireless, or whatever may be desired.

It is rather interesting to see what happens when the weight is put into fuel. We find that the ship is now capable of 50 knots for 44 hours, equivalent to 2,200 miles, or 192 hours at 30 knots, equivalent to 5,760 miles, which, I think, you will agree are rather startling figures.

Further points in favour of the rigid as compared with the non-rigid and semi-rigid are that in the first place the gas-bags are subject to no stresses except to those due to the head of gas, whilst in the second case it is necessary to exert additional pressure by pumping air into the ballonets to maintain the shape. The pressure on the envelope may be greatly increased by her progress through the air, not at the bow, where the internal pressure should about equal the external, but at the stern, where, if the airship is not of stream line form, or if any deformation takes place, a partial vacuum may be formed, and the stresses on the envelope will then be the algebraic sum of the internal and external pressures. Again, in the rigid type, should she be seriously wounded, say by a splinter of a shell—bullets do not matter particularly to either type—only one gas-bag would be damaged, and it is probable that the ship would still be able to remain in the air by using the lift obtainable from her aeroplanes; at any rate, her speed of descent would be slow. With a non-rigid, a serious wound means instant collapse. The Italians, I believe, have fitted some diaphragms inside their ships, with small holes in them, with a view to preventing the airship being completely deflated immediately she receives a large wound, but it is of doubtful value. These diaphragms also have the effect of checking the surge of the hydrogen towards the bow should it be tilted upwards, and the drop of air into the after part of the ballonets, another defect of the non-rigids.

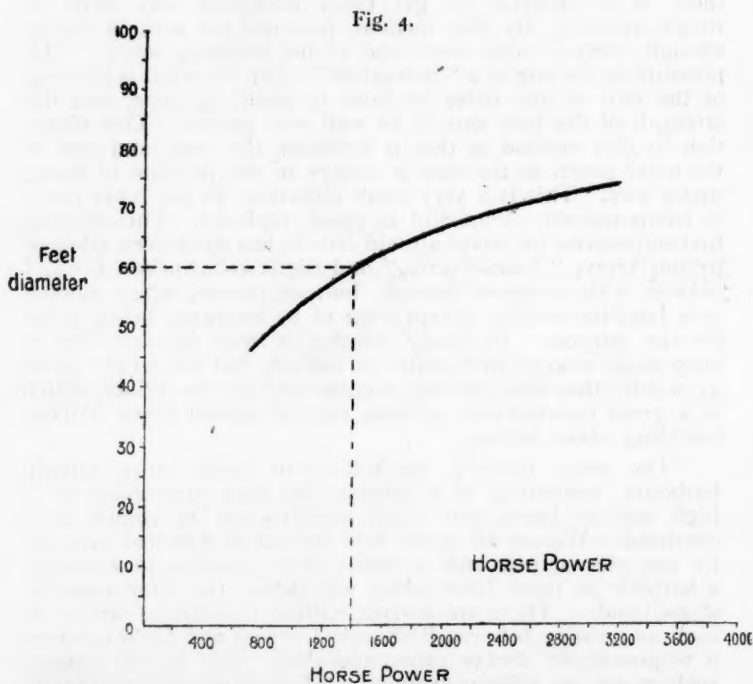
The advantages of the non-rigid over the rigid type appear to be that the deterioration of the hydrogen due to osmosis may be somewhat reduced by keeping it under pressure and so increasing its density in proportion to air, whilst, for army work it may be deflated in emergency, and the gas-bag packed up. This quality is not likely to be of great use at sea, as anyone who has had to handle a deflated gas-bag on the water will affirm. If, in addition, we take into consideration the ease of mooring a rigid ship by the bow, although the possible claims of the Astra-Torres type, with its internal roping, must not be forgotten, I think it will be granted that the rigid is the most promising type for us to develop for sea service, though the non-rigid may be of great use for harbour defence and training purposes. The main characteristics of a rigid or modern type are a number of longitudinal girders, generally built up in triangular form, running from bow to stern, and joined together in some cases by spirally winding round them a

system of similarly constructed girders, or else by connecting the longitudinals by transverse frames and staying them to each other by wires for mutual support. Inside the frames go the gas-bags, 16 or so in number, and on the outside the outer cover, leaving a foot or so air space between the two. The engines are suspended below.

In our further remarks we will consider a ship of this type capable of 50 knots for nearly two days, such as we have seen by the curve could be built, and such as Count Zeppelin could probably turn out next year if he so desired, and such as I trust British firms are also capable of constructing.

EFFECT OF WEATHER ON AIRSHIPS.

Weather has such an important bearing upon the subject of airships that it is necessary to consider the question briefly.



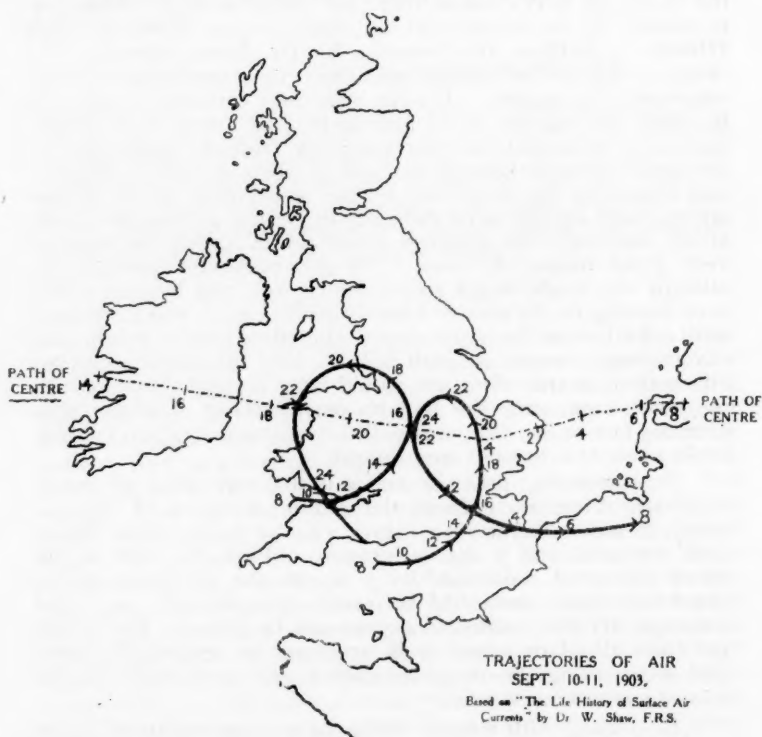
Unlike the aeroplane, which need not be sent up unless the weather conditions are considered suitable, an airship for sea service must be prepared to meet all weathers. An airship that has to live in a shed is of little use, as, when she is urgently required, the wind may blow across the mouth of the shed for days and make it impossible for her to come

out. Revolving sheds are a possible solution for small craft, but for large ones they are out of the question if only on the score of expense. There are two methods by which an airship not in use may live through a gale. The first method, and the best, of doing this is to have a fixed post in the centre of a lake, the top being the same height as the bow of the airship when the gondolas are just touching the water, the bow cap being secured as close to the post as possible. Lying in this way, should the ship be struck by a side wind, she heels over slightly, due to the drag of the gondolas through the water. The act of her heeling over, and her sideways motion, compresses the air under her, and, the gondolas being shaped to assist this, the airship rises until the gondolas slither over the surface of the water or rise just clear of it. The ship may swing through very considerable angles in this way, the only difficulty being to get boats alongside, but then, it is difficult to get boats alongside any ship in rough weather. By this method, provided the post is strong enough, there is little likelihood of her breaking adrift. The pressure on the bow of a "Schwaben" when the wind is blowing at the rate of 100 miles an hour is about 13 tons, and the strength of the bow should be well over 70 tons. One objection to this method is that it increases the wear and tear of the outer cover, as the ship is always in the position of being under way. This is a very small objection, as the outer cover is comparatively cheap and is easily replaced. This system, first introduced for naval airship No. 1, has since been adopted by the Army, "Astra-Torres," and Siemens-Schuckert firms, I believe, with complete success, but, of course, when moored over land the airship is kept clear of it, buoyancy being given for the purpose. In heavy weather it may be desirable to keep ships moored over water in the air, but for winds up to 45 m.p.h., they ride perfectly comfortably on the surface, which is a great convenience, as men can be moved about without troubling about ballast.

The other possible method is to build large airship harbours, consisting of a considerable area surrounded by a high wall or bank, into which airships can be drawn from overhead. We are all aware how the air is deflected upwards by any obstruction, and it seems quite possible to construct a harbour on these lines which will deflect the wind over the ships inside. There are several natural harbours I know of, such as a valley between Barrow-in-Furness and Dalton, where it is practically always calm, and there must be very many such places in hilly countries. Old quarries may be useful in this direction, or even large dry docks. On the whole, however, the post in the centre of a large sheet of water seems to hold the balance of advantages, and will probably be the method adopted where local circumstances permit of it.

When we come to consider the behaviour of airships at sea in relation to the weather we shall find that wireless telegraphy

is of the greatest assistance. A point in favour of the airship is that, unlike the aeroplane, it can receive as well as send a wireless message. Such importance is wireless likely to assume, that I imagine in the near future the Meteorological Office will have to be fitted with its own wireless station and work on its own special tune to transmit warnings and advice to aircraft. Dr. Shaw, of the Meteorological Office, assisted by Mr. Dines, has been working out what would happen to an airship starting at noon daily from Plymouth, and trying to



look into Yarmouth, returning at once when she has done so. The distance in a direct line is 250 miles, and on every occasion from February 21st to March 8th, the airship got to Yarmouth, except on March 2nd and 8th, when she did not start, the weather making it obviously impossible to return within a reasonable time. The longest time taken to get there was eight hours, and the shortest four-and-a-quarter, though she was only steaming at 30 knots in this last instance, and getting back was very slow work as it was assumed she

was only a 40 knot ship, so she only made five knots over the earth. In this connection the importance of good control in the vertical plane is manifest, as had this theoretical airship been able to keep very close to the surface she would have only found about half the gradient wind, whereas it was assumed that she would have to keep at such a height that she would be subject to a wind equal to two-thirds of it. The following example will show how useful wireless telegraphy would prove on occasion. Often it is a perfectly feasible plan to proceed around the centre of a storm, returning with the assistance of the N.W. to S.W. winds found on the other side. This fact is shown by the accompanying chart, copied from the *Life History of Surface Air Currents*, by Dr. Shaw, showing two cases in which a free balloon would have been carried around the centre and back again. It is not absolutely certain in those cases in which the particle of air approaches the centre very closely that it is the actual one to come away from it again; but in any case the one originates so close to where the other vanishes that they may be considered as the same, and, given engine power, there should be no difficulty in getting around the centre at all, although the distance traversed in doing so may be very great indeed at times. In this particular instance an attempt was made to get round the centres, and had the storm been moving on its normal easterly course, all would have been well. As it was the storm centre altered its course north, and the attempt to cross its path failed. Had the airship received information to this effect she would have flogged away against the wind, supposing she had no port harbour or parent ship to make fast to, or else run south into calmer weather, coming back when the weather was quieter.

An interesting point to notice is that any wind whatever, from any direction, reduces the radius of action of aircraft, which is a maximum in a calm. Let x be the time flying with the wind and y the endurance. Then the sum of the speed and wind multiplied by x equals the difference of the speed and wind multiplied by $(y-x)$. y is known, so x and consequently the radius of action can be found. For winds not from ahead or astern it is necessary to resolve the speed and wind along the proposed course and then work out the formula in the same way.

In dealing with aircraft which have large radius of action we must enlarge our ideas of distance. I should not be surprised if in the near future it was considered quite an ordinary event for an airship to run 600 miles north or south to avoid the central regions of a storm. Dr. Shaw points out that it is highly desirable for aircraft to avoid the S.W. to N.W. quadrant of a circular storm on account of the prevalence of "line squalls," such as destroyed H.M.S. "Eurydice" off the Isle of Wight. There has been one case of a free balloon being caught in a squall of this description and being brought to earth. Whether a dirigible could weather one we have yet

to learn, but probably so, as, if well handled, her horizontal rudders will assist her in addition to her being able to discharge ballast. A phenomenon of these line squalls is that they have a downward trend accompanied frequently by hail or snow, the weight of which tends to bring the airship down. Summing up, we see that from aeroplanes we may expect to be able to scout over comparatively short distances as compared with the longer ones a dirigible is capable of, and that an aeroplane is capable of taking shelter in bad weather while a dirigible is not; and, having regard to their respective limitations, we will now see how these types of aircraft may be used in connection with the Navy.

AEROPLANES FOR SCOUTING PURPOSES.

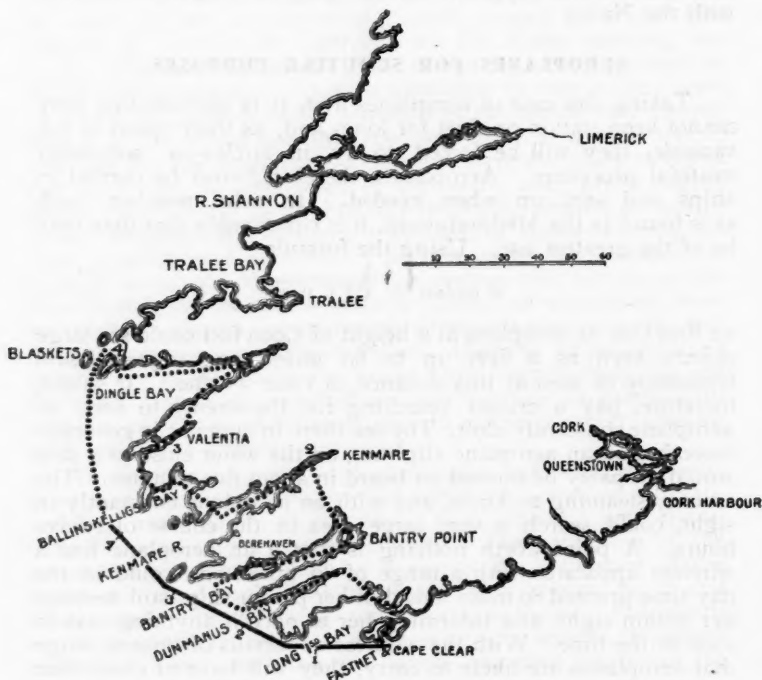
Taking the case of aeroplanes first, it is obvious that they cannot keep station on fleet for long, and, as their speed is not variable, they will be forced to fly in circles—a somewhat wasteful procedure. Aeroplanes, therefore, must be carried in ships and sent up when needed. In calm weather, such as is found in the Mediterranean, it is conceivable that they may be of the greatest use. Using the formula

$$d \text{ (miles)} = \sqrt{\frac{2}{3} h \text{ (feet)}}$$

we find that an aeroplane at a height of 5,000 feet could see large objects such as a fleet up to 80 miles, and objects could frequently be seen at this distance in clear weather. It would, therefore, pay a cruiser searching for the enemy to keep an aeroplane constantly aloft. The sea there in summer is generally smooth, and an aeroplane alighting on the water close to a ship would probably be hoisted on board in about five minutes. The cruiser, steaming 20 knots, and with an aeroplane constantly in sight, could search a very large area in the course of twelve hours. A point worth noticing is that if an aeroplane had a wireless apparatus with a range of 80 miles, she could in the day time proceed 80 miles ahead of her parent ship, still keeping her within sight, and informing her at once if anything was in view at the time. With the wireless apparatus of limited range that aeroplanes are likely to carry, they will have to close their parent ship to a distance of about 30 miles before they can get their news through—an unfortunate but necessary waste of time, which after all only amounts to about three-quarters of an hour. It will be seen that on a fine weather station aeroplanes facilitate the search for the enemy to a very great extent. It is a rather different matter when we consider their use in the North Sea. There, the average range of visibility is something in the neighbourhood of six miles. The weather is frequently bad. It may be easy enough to start an aeroplane from a ship even if it is blowing quite hard, but picking it up again will not be so easy. In this respect aeroplanes are similar to torpedoes. One can start them from a ship all right, but everyone is devoutly

thankful to see them on board again. One can better imagine than describe the feelings of a captain of a ship searching for an enemy with the aid of an aeroplane when the aeroplane's engines fail and cause it to alight on the water some 30 or 40 miles away from him. He must either sacrifice it, if time will not permit of his picking it up again, or two or three hours of valuable time must be wasted in looking for it, picking it up and getting under way again. It must also be remembered that

Example: To search from Cape Clear to the Blaskets.



WITH AEROPLANE : Ships speed, 21 . Aeroplane speed, 70 knots.

Time required, 4½ hrs.

WITHOUT AEROPLANE : Ships speed, 20 knots (allowing 1 knot less for turns.)

Time required, 15 hours.

once the aeroplane loses sight of a ship, it is doubtful if it will ever find her again. We have only to take the unfortunate case of the late Mr. Cecil Grace, who, starting from Calais in a slight haze, missed Great Britain only 21 miles away. It is true that naval officers should be more practised in the use

of the compass than he was, but, even allowing for that, it will require a very skiful, and, I might add, lucky navigator of an aeroplane to find his parent ship if he loses sight of her for half an hour, more especially if his parent ship was also under way. In this connection it might be considered whether, if kites were sent up to a height of about 1,500 feet, they might not often be of use for scouting purposes, their advantages being that they cannot be lost, and the observer is in direct telephonic communication with the ship. A situation where aeroplanes will, however, be of the very greatest use is in searching a deeply indented coast for the enemy's ships and torpedo craft. A chart of the S.W. coast of Ireland shows the course to be pursued by a 21 knot scout searching for hostile torpedo craft and by the same scout when assisted by an aeroplane. It will be seen that the aeroplane could search the whole coast in four-and-a-half hours, and regain her ship. The scout, if searching all the bays and harbours herself, supposing we reduced her speed on an average to 20 knots to allow of her frequent turns, would take 15 hours to do this work, and, if the days were short, two days would be required. Of course, an aeroplane, scouting at this rate, could not be certain of locating torpedo craft or submarines deliberately attempting to hide themselves. That work would be better done by an air-ship; but it should have no difficulty in locating anything in the shape of a commerce destroyer or some similar craft. A point against the aeroplane in this connection is that its parent ship must approach fairly close to the coast, even if the visibility is as great as 20 miles, in order to keep the aeroplane in sight, thus exposing herself to attacks from submarines and mines. Probably the procedure that would best be followed would be for the parent ship to send up her aeroplanes and retire to sea again, rendezvousing off some prominent point some four or five hours later. Should the parent ship be lost or sunk, any information the aeroplane may have obtained becomes useless, and the aeroplane becomes a gift to the enemy.

A service in which the aeroplane will probably prove of great value is that of locating mines and submarines in narrow waters. In the estuaries of rivers and other muddy places mines will, of course, be invisible, and the periscope of a submarine submerged in a tideway will probably not be observed by the fast moving aeroplane. In clear, smooth water everything should be visible, especially with a bright sun. All seamen know how a ship may pick her way through a coral reef when conned from aloft, and all fishermen know how the movements of fish in a stream may be watched from a bridge. Any ships approaching waters where mines or submarines may be expected will have a good chance of getting through unscathed if they choose a nice bright day and have aeroplanes searching the sea in front of them. Another use for them will be to watch narrow channels, so as to give warning of the approach of the enemy to our own submarines and mine layers.

We are particularly fortunate in that we have bases on narrow channels in many parts of the world. It seems probable that aeroplanes will attack submarines with success provided the submarine is submerged. A good pilot, passing close above the submarine, should be able to drop a charge of guncotton, arranged to explode well under water, within a few feet of the submarine. This would destroy the submarine or bring her to the surface; but not the aeroplane, as she would have passed some distance from the scene of the explosion when it took place, further than in the case of steamboats firing spar torpedoes.

AIRSHIPS FOR SCOUTING PURPOSES.

Turning to airships, we see that a 50 knot ship can keep station on a fleet steaming 15 knots, provided the wind is not blowing more than 35 miles per hour from ahead or more than 47 on either beam. As the wind draws abaft the beam so she is able to keep station in a stronger breeze, and if the wind is right aft and blowing 65 miles an hour, she can still keep station on her fleet by steaming against it. That is to say that on most days an Admiral could use her just as he would a cruiser, making use of her increased range of vision on a clear day, with the additional advantage that he could send her to look into an enemy's port, knowing that she is immune from damage by submarines and mines, and far less liable to damage from gunfire than any ordinary ship, while her wireless range is just as great. The question of losing her in thick weather does not apply, as the airship is self-contained and can find her own way about. A sextant is now made which allows of a sight being taken even when no horizon is visible, and, from experiments made with this, there should be little difficulty in fixing the position to within five miles. Certainly the conditions for taking sights are far more favourable than in a destroyer. The vibration on the top of the airship, with the engines running full power, is practically nil. Fogs are often low lying, and it is conceivable that in the future, an airship may be prepared to rise above the fog and report the position of the fleet below. If it is found impossible to rise high enough to see the sun, the airship can be navigated very well by dead reckoning, her leeway being judged by dropping some article or smoke-producing chemical on the sea and taking bearings on it; or else it is possible to stop engines and drift with the wind a few minutes, when the strength and direction of the wind can be found in a similar manner.

A tremendous advantage that the airship has over the aeroplane is that it can work at night, as well as by day. It seems probable that from a height of 1,000 feet the glare of the funnel of a warship would be visible at night, and, should this prove to be correct, an airship should have no difficulty in hanging on to the enemy's fleet by night as well as by day.

and keeping the Admiral informed of their movements. For blockade work, too, they can be in a given position for long periods. For instance, taking the mean of 35 years' observations from the Sailing Directions, an airship could have watched Pembroke every day, except for 23 in the year. Again, the table below shows the strength of the wind at Oban, at 7 a.m. and 6 p.m. on every day of 1911. The wind here shown is the gradient wind usually found at a height of 1,500 feet, and this is

TABLE SHOWING GRADIENT WINDS AT OBAN, 1911.

Wind Velocity M. P. H.		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
100 or over	7 a.m.	—	—	—	—	—	—	—	—	—	—	1	1	2*
	6 p.m.	—	—	—	—	—	—	—	—	—	—	1	—	1*
90-99	7 a.m.	—	—	—	—	—	—	—	—	—	—	1	1	2*
	6 p.m.	—	—	—	—	—	—	—	—	—	—	—	—	0*
80-89	7 a.m.	—	—	—	—	—	—	—	—	—	—	—	—	0*
	6 p.m.	—	—	—	—	—	—	—	—	—	—	—	—	0*
70-79	7 a.m.	—	1	—	—	1	—	—	—	—	—	3	—	5*
	6 p.m.	—	—	1	—	—	—	—	—	—	1	—	3	5*
60-69	7 a.m.	—	2	—	1	—	—	—	—	—	1	—	—	4*
	6 p.m.	—	—	—	—	—	1	—	—	—	—	—	—	1*
50-59	7 a.m.	1	5	—	—	2	3	1	—	—	3	1	4	20*
	6 p.m.	1	2	1	1	—	—	—	—	1	2	4	4	16*
40-49	7 a.m.	2	2	5	4	1	1	1	3	1	1	4	2	27†
	6 p.m.	7	6	3	3	3	4	—	3	1	2	6	6	44†
30-39	7 a.m.	12	5	7	6	1	4	6	4	7	3	9	11	75†
	6 p.m.	14	3	10	4	1	2	6	4	7	2	9	6	61†
20-29	7 a.m.	11	4	12	6	10	5	10	10	8	9	8	10	103†
	6 p.m.	6	8	8	10	9	7	11	13	10	7	5	8	102†
Below 20	7 a.m.	6	9	6	14	16	17	13	14	11	14	3	2	128†
	6 p.m.	3	8	8	12	18	16	14	11	11	17	5	4	127†

* On 56 occasions wind velocity greater than speed of Airship (50 m.p.h.)

† On 337 occasions wind velocity less than speed of Airship (50 m.p.h.)

generally double the wind found on the surface. But, taking the maximum gradient wind, it will be seen that there were only 56 occasions on which the wind recorded exceeded 50 miles per hour, so that we may take it that on 28 days of the year on an average a blockading airship would have been blown away. If we accept the principle that a gradient wind is double that near the surface of the earth, could the airship have kept

low, there were only three occasions on which she would have been blown away.

The question of replenishing with fuel and oil from a ship at sea will probably not be found difficult, even in bad weather, as it can be blown into her very rapidly with compressed air through torpedo charging pipes. Once an airship is in tow of her parent ship—and there should be no difficulty in getting in tow, as the airship would drag her bow hawser over the ship—it should be possible to send a charging pipe out along the towing hawser, to connections on the bow cap, communicating with the petrol, oil, and gas-bags.

A man on the bow cap, hauling his charging pipe out, would connect it as requisite. A device brought out by Engineer-Commander Metcalfe some time ago for the purpose of permitting a collier to be towed by a battleship in heavy weather, which I believe is now either supplanted by a better device or not found necessary, would, I think, be very useful for towing airships. This consisted of an ordinary recoil ram from a gun-mounting, working in the recoil cylinder, with the keyway removed and the piston made solid. The cylinder was then filled with water and connected to the air reservoir of a torpedo, which was half filled with water and then charged with air to a considerable pressure. This absorbed very heavy shocks and jerks with the greatest ease, and something of this sort will probably be of assistance when it is desired to tow large airships. There is, of course, a certain danger to an airship approaching a ship, or being towed by her, from the sparks from the funnel; and it is desirable to fit baffle plates in the funnels and tow with a long scope. A gas-engined ship, of course, overcomes this difficulty. It may be that a large submarine will make a very suitable vessel to tow an airship at first, there being no danger of sparks in her case. Should an airship be caught at sea in heavy weather, with no ship available to make fast to and she does not wish to run far, it would be possible for her to lie at a drogue. Experiments in this direction have given very promising results, and it seems quite probable that with a good large drogue down and as near neutral buoyancy as possible, an airship will be able to reduce her speed of drifting to about a quarter that of the wind and maintain herself just on, or clear of, the tops of the waves by means of her aeroplanes.

In searching for hostile submarines the airship has an advantage over the aeroplane in that she can hunt slowly and carefully with four times the number of lookouts. She can also attack them, as an aeroplane might, by dropping gun-cotton, but she could not come so close to her target, so she would have less chance of dropping the charge sufficiently close to do any damage, though this might be more than compensated for by the superior instruments and greater charge she could carry. To keep aircraft off, submarines would have to remain on the surface, where they are liable to be attacked by ordinary ships, so, when once they are located, their position

will not be very enviable. Once the battle fleet know the whereabouts of the submarines they can easily avoid them, and the long-range wireless telegraphy of the airship is a very great advantage here, as she can pass information without losing sight of the enemy; in fact, wireless is at present the most important part of the equipment of aircraft, practically doubling their range and utility, and once they have got important information through, it does not so very much matter what ultimately becomes of them. Another possible use of airships is that of repeating ship in a fleet action. Being clear of smoke and out of range of hostile fire, signals could be easily made and read; in fact, the general view of a fleet action will be much better obtained from aloft, so much so that it is conceivable in future that a commander-in-chief may find it advantageous to direct his fleet from an airship at a good height, notwithstanding his natural desire to lead his fleet into action personally.

If we come to consider what damage could be done by aircraft dropping large quantities of explosives, say in the neighbourhood of a ton weight, it opens up great possibilities for attacking dockyards and such like places. It seems improbable that aircraft will ever be able to do much damage to battle fleets at sea, but should it be possible to explode large quantities of gun-cotton in a basin, or in the neighbourhood of lockgates, the effect would probably be disastrous to all ships lying inside. When we come to consider the large number of torpedo craft a commander-in-chief would be prepared to sacrifice to destroy an enemy's repairing resources, and to damage his ships lying in basin, I think it will be agreed when the question is studied that if we put the equivalent cost in money into airships, we should have a far greater chance of success, and probably do infinitely more damage.

THE ARMING OF AIRSHIPS.

We have not so far taken into consideration that the enemy would have aircraft as well as ourselves, but, naturally, this would be the case. It follows, then, that we should have fighting in the air, either in an endeavour to force our way through the screen of hostile aircraft to obtain the information we required or to prevent him from doing the same. Therefore airships will have to be armed, and I believe it is true that the French and German airships are being so armed; in fact, I have here a specification for an airship for one of these Powers, giving the weight of gun and the number of rounds to be carried, but whether the ship has actually been ordered or not I do not know.

Volume, not to exceed ... 353,000 c.f.

Length not to exceed ... 262 ft.

Total height of ship not to exceed ... 82 ft.

(N.B.—The car is a long way below the envelope).

The ship would have sufficient lift to carry the following weights:—

14 persons at 165 lbs. each	...	2,310 lbs.
Fuel, oil, and water for 20 hours' flight	...	4,180 lbs.
Machine or automatic guns	...	220 lbs.
Ammunition	...	792 lbs.
Wireless apparatus (250 miles)	...	385 lbs.
Searchlight (to light up landing place from a height of 600 ft.)	...	110 lbs.
Ballast necessary for attaining altitude of 5,500 feet above sea level, besides fuel, &c.	...	4,840 lbs.

Total ... 12,837 lbs.

Or about 5½ tons.

On the last occasion I spoke here, during the discussion on Capt. Burke's lecture,¹ I mentioned that rigid airships could mount guns on the top, and I am afraid some of the audience imagined that I was drawing the long bow. In partial proof that it is possible, however, I have here a slide of photograph of Naval Airship No. 1 with five men on the top. If you take the weight of a man at 120 lbs., we have more than double the weight of a Maxim gun, and I can assure you that five is not by any means the maximum number who have been working on the top at the same time. Mounting them in the gondolas is, of course, easy, as everyone will agree. Aeroplanes will doubtless be armed too, probably with some sort of shot gun rifle or repeating pistol. It matters not for our argument how aircraft are armed so long as we agree that they will carry weapons. Once fighting starts we logically come to fleet actions in the air, each side endeavouring to concentrate the greatest number at the decisive point. This at once points to the necessity for one Aerial Service, and I am very glad to see that it is proposed to train Naval and Military aeroplane officers at one school. It is a commonplace that if two squadrons of different nationalities are combined against a single fleet the single fleet has the advantage. Similarly, if at any time we had to concentrate Naval and Military aircraft against an enemy who has but a single air service, we should be at a disadvantage, because we should not have been able to practise and work together properly.

FUTURE DEVELOPMENT OF AIRCRAFT.

As regards the future development of aircraft, there is, as I have endeavoured to show, no visible limit to the growth of the rigid airship. They are on the same footing in this respect as water ships. As regards aeroplanes, the case is rather different, and unless some more economical motor is found, it

¹ See December, 1911, JOURNAL, page 1635.

does not look as if they would be able greatly to exceed twelve hours in the air, carrying only one man. If we take the aeroplane that we have been discussing to-day and put the whole weight she can carry into petrol and oil, allowing nothing for the pilot, she could fly for $11\frac{1}{2}$ hours. If, now, we double the size, we double the weight of fuel carried, but we double the resistance, so that we double the horse power required to move her at the same speed, and nothing is gained. For practical sea work the grave doubts of finding their parent ship again in foggy regions like the British Isles will probably limit their use for long distance scouting. Possibly four hours endurance will be found sufficient, and the weight so saved will be utilized to provide more powerful wireless or carry a larger supply of guncotton for use against submarines, or, again, it may be devoted to carrying an extra man for fighting in the air.

The chief objection to airships is their expense, though four can be built for the price of one destroyer. Unfortunately, in addition, they require sheds for occasional docking, posts to lie at when not in use, or else special harbours, and all this means more money. Aeroplanes, on the other hand, are cheap—about the price of a torpedo. The sheds for docking them are cheap, and they can be easily carried on ships with but little alteration. For harbour defence, for work with our submarine flotillas and increasing the range of vision of ships by scouting around them and attacking submarines they are excellent; but for long distance work, blockade work or forcing a way through a screen of hostile aircraft you must have the airship. The airship bears to the aeroplane the same relation as a battle cruiser does to the torpedo boat. Building battleships whilst not neglecting torpedo craft has always been Great Britain's policy on the sea, and appears to be Germany's policy in the air, whilst the French still continue their policy of depending largely upon torpedo craft on both sea and air. I trust that in the future our policy in the air will be the same as it has been at sea; and I have little doubt that as the science of aeronautics develops the command of the air will prove to be necessary for us if we wish to keep the command of the sea. The fleet without aircraft to assist it will be at a tremendous disadvantage as compared to one with them.

In conclusion, I must heartily thank all those who have assisted me in the preparation of this paper. I have written to various airship officers of the Navy and Army, to the Meteorological Office and the Advisory Committee Laboratory, and, not only has every question been kindly and promptly answered, but they have all gone out of their way to assist with information. When busy men such as these will give so much time and trouble in the preparation of tables, etc., in order to assist a stranger, it points to their intense interest in aeronautics, and augurs well for the future of the science in this country.

DISCUSSION.

Baron Roenne said that his opinion was that many people overvalued the importance of aeroplanes and undervalued the services of airships. The larger they built a ship the more economical she was in the ratio of efficiency to the cost of running. The same geometrical and mechanical principle applied to the airship. If they doubled its linear dimensions—even if they made its walls three times as thick—they would get eight times the cubical space and eight times the buoyancy. But they would require only *four* times the propelling power to drive it at a given speed. The principle of the cube and the square would always be on the side of the large ship.

The result was just the opposite when they doubled the size of an aeroplane; the ratio diminished. It would, therefore, be impracticable to build very large aeroplanes. A well-known aviator had recently written as follows:—

"What is not a commonplace yet, but may soon become one, is that the next great war will be fought in the air, and that 100 super-Dreadnoughts will then be as useless as a fleet of cockleshells. Go to Hendon or Brooklands and learn how near is that possibility."

Could anyone believe that an aeroplane would ever discharge such deadly projectiles as a super-Dreadnought, or would ever sink a battleship? No doubt they would be of great value for scouting and despatch work in war time, and also to attack the enemies' aircraft with rifles, not with machine guns as had been suggested; machine guns were good on land, but it was impracticable to carry them on aeroplanes. An airship, on the contrary—say of 44,000 cubic metres capacity, 200 metres long and 18 metres diameter, with rigid bow, and engines of 1,200 H.P., producing a speed of 55 miles per hour, capable of moving easily vertically and horizontally, and of standing still in its element, and floating for some days—would be of great value both for naval and military purposes, especially for destroying forts and towns at night.

No doubt he would be asked, "Are we able to build such a vessel to-day." He replied, "Yes"; the industry of to-day could furnish everything desirable for aerial navigation, and that even to a remarkable degree of perfection. It was only a question of correctly appraising and utilizing the means at their disposal.

Mr. Grahame White said that he had been extremely interested in Lieutenant Boothby's valuable lecture, but unfortunately it had been devoted very much more to airships, about which he understood very little, than it had been to the heavier than air machines. His experience in lighter than air machines started in Paris somewhere about 1902-3, when he had the pleasure of visiting M. Henri Deutche le Meurte at St. Cloud, for the purpose of seeing the first trials of his dirigible.

A TRIP IN THE "VILLE DE PAU."

Later he was down at Pau in the south of France, where he was learning to fly aeroplanes. He was on one occasion a passenger in a flight made by the "Ville de Pau." It was only about once a month that this dirigible would venture out of its hangar, though the heavier than air machines were flying every day. It took about three or four hours to get this dirigible out with the aid of two or three regiments or battalions of French soldiers. There could not have been more than about a ten miles an hour wind blowing, but they experienced the very greatest difficulty in getting the balloon clear. There was a large space

in front of the shed, but in getting up they fouled the shed and carried away a lot of guide ropes. When they had made a flight in a straight line, the captain tried to turn round and come home. He first put his helm hard over to port, but the vessel took not the slightest notice of the rudder. He then put the helm hard over to starboard, and after seven minutes she seemed to go to port and they eventually got round. They made about 20 various attempts to get back to the dirigible's shed, ten miles away. When they eventually reached the shed their trail ropes were all let down, and they fouled everything. They carried away all the telegraph wires and nearly pulled the shed down. Eventually some of the soldiers got hold of the guide ropes, and in about another hour they were all safely landed. He had never yet ventured up in another dirigible, and he was not very likely to. The Lecturer had in the course of his paper put forward the advantages of the dirigible. He (the speaker) frankly stated that he did not think the dirigible had any future before it whatsoever. Its great cost, for a start, was very much against it. A large fleet of aeroplanes could be purchased and equipped for the cost of one dirigible. And he did not think there had been one single dirigible that had lasted more than three months from the date of its birth, while very few of them had come through their trials at all satisfactorily. A great deal had been said about the marvellous way in which the naval dirigible rode at her anchorage at Barrow; but within a month of her birth that dirigible was a complete wreck. If the Admiralty rebuilt that dirigible they would be throwing their money down the sink. The Lecturer had said something about these dirigibles cruising in 50 miles an hour winds; or even, in one instance, in 65 miles an hour winds. He did not think the Lecturer or any of this audience would like to be a passenger in a balloon under such conditions. He candidly did not think that any dirigible could live in such a wind. First of all there was the huge bulk of the envelope; then it could not be held to the ground, and if it was once liberated he doubted if it would ever be got down again. It required a tremendous staff to look after such a vessel.

Then the Lecturer had referred to the question of the speed of these dirigibles. Some very big speeds were mentioned—speeds which he had never heard of being attained by dirigibles except under the most ideal weather conditions—in a perfect calm.

Then, again, the Lecturer had remarked that aeroplanes were more or less fair weather machines, and he had put it as an advantage held by the dirigible over the aeroplane, that it could go out under weather conditions which the aeroplane could not go out in. He was diametrically opposed to that statement. He affirmed most emphatically that aeroplanes—heavier than air machines—would fly, and fly satisfactorily, in winds in which dirigibles had never been known to be outside their hangars, and that this had been proved within the last few weeks. That was a very great point in favour of the aeroplane—that it could take the air under conditions where the dirigible would not venture up. Again as regards the destruction of the dirigible, he would rather be in an aeroplane than in a dirigible under war conditions. He thought he would have a very much greater chance of getting off scot free in an aeroplane than in a dirigible. He did not think the dirigible would have much chance of getting to land safely again against a fleet of aeroplanes. First of all they must remember the superior manner in which the heavier than air machine could rise; its greater control, and its speed. It would simply waltz round the dirigible. It would get right above it and drop bombs on to it and probably

annihilate it, before the dirigible would wake up and know that there was any aeroplane in the neighbourhood.

Another question referred to by the Lecturer had been the time that a pilot could control an aeroplane; he said he did not think it possible for one man to control an aeroplane for a period of longer than six-seven hours.

The Lecturer: Nine hours, I said.

Mr. Grahame White said it was an accomplished fact. It had already been done, and therefore there was no doubt about it.

The Lecturer: I added as well "And to keep an efficient lookout, to scout."

Mr. Grahame White said his experience of flying in an up-to-date aeroplane was that he was as happy there as in an arm-chair, and—that being the case—he did not see why he should not keep an efficient lookout, just as much as one did when driving a motor. Of course, it was tiring; even driving a motor car for six or nine hours was tiring; but no more so than flying an aeroplane except under very adverse conditions.

Then he thought the Lecturer had stated that it was impossible—or that it would be impracticable—for aeroplanes to land on ships. He did not think that was so. A very strong wind would be of great assistance when landing on a ship for the reason that it would be quite possible for the ship to so manoeuvre that the aeroplane could alight on it practically at a standstill; so that if the wind was a very strong one the aeroplane would be practically stationary in the air. It would run into ropes to which sand bags could be fitted. He had seen aeroplanes alight on ships in that way before, and make most perfect landings without the slightest danger to the pilot or to the machines; and those were demonstrations which he himself would only be too pleased to carry out. It would be just as easy to land on a ship in calm weather for the reason that you got the speed taken off your aeroplane by running into ropes stretched across the platform, so that if you ran into one rope it would take off the speed of the machine.

WIRELESS TELEGRAPHY ON AIRCRAFT.

With reference to wireless telegraphy on dirigibles, at the present time, it was possible that the dirigible had the advantage of the aeroplane in that respect, merely for the reason that the dirigible was somewhat of older standing than the aeroplane, and that few of them had experimented at all with wireless on aeroplanes. That was simply due to the fact that the wireless engineers had not produced any instruments very suitable for the purpose. As soon as they did so he did not think they would be able to claim any very great advantage for the dirigible for wireless purposes. He was present in the United States when several very interesting experiments were made on aeroplanes with wireless. They were highly satisfactory, but as the Lecturer had quite rightly said, they were at short ranges, merely for the reason that the apparatus supplied by the wireless engineers was only made for short ranges, and that was the commencement of the experiments. The Lecturer stated in his paper that the apparatus only weighed 250 lbs., and if that would give a long range they could carry it on the aeroplane just as well as on the dirigible. As regards storms, was it not the fact that these storms raged at various altitudes? Was it not quite possible for a storm to take place anywhere between the earth and 6,000 and 7,000 feet altitude? Would it not, therefore, be possible to rise above the storm?

The Lecturer: I think not.

Mr. Grahame White said that was a question upon which he should very much like to be enlightened. At any rate, it was a fact that, at various altitudes, more or less constant winds were blowing. He had been up in balloons where he had crossed the same point seven times at various altitudes; which proved, for the sake of argument, that at 1,000 feet level there might be a due east wind blowing, and at the 3,000 feet level a due west wind blowing, and so on.

Those elements would be very much in favour of the aeroplane, which could mount so much quicker and come down so much quicker than the dirigible, so that an aeroplane could make use of those conditions in a very much more rapid manner. Even if the dropping of gun cotton in the neighbourhood of submarines did not put the submarines out of action, would not the explosion of the gun cotton in their neighbourhood cause such a concussion that it would probably kill everybody in the submarines? The Lecturer had also made the remark that he did not think the aeroplane would be of any use at night. It had already been demonstrated that it could be, and he thought there would be absolutely no difficulty in proving it. He himself had been flying in the air for two and a half hours in the dark, on his way towards Manchester, without any moon, stars or anything else, so there was no reason why it should not be done again. He thought the aeroplane would be just as satisfactory under night conditions as the dirigible.

AEROPLANE DESTROYERS.

A great deal of attention was being given to scouting machines—machines for reconnaissance and machines for despatch carrying. He was, of course, referring to heavier than air machines. But it appeared to him that little attention had been given to aeroplane destroyers, and he thought that was a point to which very great attention should now be given. He thought in the near future it would be necessary for those machines that were doing reconnaissance work, the scouting, to be accompanied by destroyers. In order to prevent the enemy's scouting machines coming over our line it would be necessary for aeroplane destroyers to be hovering over halfway between ourselves and our enemy in order to prevent the enemy's scouting machines from crossing the dividing lines. Those machines would have to be equipped with quick-firing armament to ward off the attacks of the enemy's aerial fleet, and to keep their scouting machines from crossing the dividing line.

With reference to bombs, he thought it was a pretty well-recognized fact that bombs did very little damage. On impact they sent up a discharge in the shape of an inverted cone, which did very little damage at the base. He believed that *time bombs* which would explode at a certain height above the ground, dropped on camps, fortifications, and so forth would do far more damage than the bomb they knew at the present time. Sir Hiram Maxim was, he believed, at present hard at work designing time bombs of that description.

Captain P. H. Wright said that there was one remark which Mr. Grahame White had just made as to rising above the storm on which it might be advantageous to seek more information. Was it possible to ascertain the vertical height of these barometric depressions such as the Lecturer had shown them in the course of a storm centre passing over England? Perhaps Dr. Shaw might be able to inform them if there was any limit vertically to these depressions.

Baron Roenne said he would like to answer one or two of the points raised by Mr. Grahame White. The latter had mentioned that the pressure against the envelope of the dirigible at 50 knots would be very excessive. It was really only 75 kilograms per square metre at a speed of 56 miles an hour. Further, he thought one could rise in an airship over the storms fairly easily. It was quite possible, however, to construct a revolving dock or a turntable with a movable platform so that the airship could be anchored in its whole length and brought to the shed by means of motors and not by means of soldiers. As long as the ship was suspended in the air it was out of danger, and when landing was effected in the manner prescribed, the risk of impact was quite insignificant. They could also provide the vessel with a lift. The vessel, while suspended in the air, could be anchored to a battleship, or any kind of ship or intermediate station. The lift could be lowered to take on board petrol or explosives, and compressed gas in cylinders, or a gas tube to refill the vessel. Thus it would be seen that the airship could be supplied with its necessities while up in the air. That would cause, not only safety, but also a great reduction in the cost of manipulating the airship.

Mr. Howard T. Wright said that the Lecturer had made out a very good case for the airship, but it seemed to him he had left out one consideration that Mr. Grahame White had referred to, namely, that an airship did not remain an airship for a sufficient length of time to get any real results from it. It seemed to have a great desire to return to its original elements. There seemed to be no doubt that an aeroplane had advantages over the airship in almost every particular, perhaps chiefly in speed. The aeroplane could, at the present day, do 80 miles an hour without any very great difficulty, and probably before very long it would be able to do very much more than that. As far as they knew at present the chief use of the aeroplane in war would be to get information. A battleship would probably carry 15 or 20 small aeroplanes, which could do about 80 miles an hour, so that in one and a half hours they could go out 50 or 60 miles, and come back and give information even without any wireless attachment. Twenty aeroplanes could probably be stored in a place something like 15 or 25 feet square; they could land on the water, be picked up and taken to pieces in a very few minutes, so that it was very difficult to see what the advantages of an airship would be over those of an aeroplane.

Mr. Charles Grey said he would like to endorse what Mr. Grahame White and Mr. Howard Wright had said in favour of the aeroplane, especially for naval work. It seemed obvious, speaking purely as a layman, that quite a number of aeroplanes could be stored on board even the smallest type of warship used to-day. An aeroplane could travel at approximately 80 miles an hour; it could go 20 or 30 miles from its ship at a height of 3,000 feet, so that the pilot could sweep the sea for a matter of at any rate 40 or 50 miles ahead of his ship. That must be an immense advantage over any form of airship. Possibly for coast work the dirigible might be useful, but he would like to know how the large rigid balloon could be of any use for real sea work.

The Lecturer, in reply, said: Mr. Grahame White's experience in an early dirigible was very interesting, but it must be remembered that that was at an early stage in the history of the dirigible. I imagine that M. Bleriot and the Wrights in their early aeroplanes had equally upsetting and disturbing trips.

Mr. Grahame White said that those experiences were only two years ago.

The Lecturer: Aeroplanes are cheap things. It is fortunate that is so, because private individuals can experiment with them, develop them, and get ahead. But rigids are expensive things, and it is necessary for the Government to experiment with that class of aircraft. That has not been done at present to any great extent. When, however, the same number of rigids or other types of airships have been built as aeroplanes have been up to date, I think you will find the position rather different. It is quite true, as Mr. Grahame White very rightly pointed out, that for the cost of one airship you can build a large number of aeroplanes. I am not saying that a large number of aeroplanes are not highly desirable; but it is no good having 2,000 aeroplanes on Portsmouth beach if you want to get to Gibraltar. They could not get there, and an airship could. Similarly, it is no use having a number of motor boats round England if you want to get to New York; you must have a liner. Then, again, with regard to the question of the length of time that dirigibles last; Mr. Grahame White has said that they have not lasted very long. But the "Schwaben" is going very strong now. I see in to-day's paper that she has already carried 2,000 passengers, charging them £10 a head for the trip, so that she is doing very nicely, commercially. The behaviour of the naval airship at her mooring at Barrow was looked on as the most important trial with that airship. Everybody knows that these airships fly perfectly. The "Zeppelin" type has never had any accident whatever in the air, except due to the motor breaking down. We know when we get them in the air they will fly. All the accidents have occurred when at their mooring, and I think this method of mooring by the nose will mark an epoch in aeronautics, and will solve the problem of airships for sea service. With regard to the question of the speed of airships, the "Schwaben" does 43 knots per hour, with 465 h.p. engines, and the "Victoria Louise" does 47.¹ I look at the airship and the aeroplane as being in exactly the same relation as the battle-cruiser and the torpedo-boat. We have enthusiastic torpedo-craft officers, just as we have enthusiastic aeroplanists, who say that the day of the battleships is done. We know perfectly well that if a torpedo-boat *does* get into such a position that she can get enough torpedoes into the big ship—say two—the latter is finished. But there are other officers who maintain that they will knock a dozen torpedo-boats out before they can come within torpedo range of their ship, and the question is not decided yet. We still have big ships, and we still have torpedo-craft, and the same discussion will go on with regard to air craft. Some people will say that aeroplanes can get above the airship and drop a bomb on to her and finish her. On the other hand, some people will say that the airship can have Maxims on top and below, and the crew armed with shot guns, and destroy any aeroplane that comes near her. Probably in another twenty years' time we shall find that problem is not yet settled.

WIRELESS TELEGRAPHY.

With regard to the question of wireless, the wireless installation for a 250 mile range adopted on the foreign airship mentioned weighs 385 lbs. An aeroplane can carry that weight, I suppose, but she would not get the

¹ Since this paper was read it is reported that on May 31st "Z₃" covered 438 miles at an average speed of 41 knots, commencing the flight at 11 p.m.—F.L.M.B.

same range because she would not have the same sized aerial. There are a great many things that come into play in regard to wireless besides actual power and weight. There is the size of the aerial, suitably disposed instruments, and so on; and I do not think anybody has ever yet suggested that aeroplanes will be able to receive wireless messages in the air. One knows that at sea an immense amount of trouble is taken to exclude all noises from the wireless office in order that messages can be received, so that it is not at all likely that an aeroplane will be able to receive wireless messages.

ALIGHTING ON A SHIP.

With regard to the question of alighting on a ship; I know that has been done in America in calm weather. Mr. Grahame White says that it can be done when it is blowing hard. I should not like to try it, and I should not like to see him try it, knowing the sort of eddy currents and draughts that you get round a ship. I think that an intermediate wind, between a calm and a wind of 60 miles an hour would be more troublesome than any of them. That question will, I suppose, be solved in the near future, but personally I should be very sorry to try, or to see anybody else try, to land on the quarter deck of any ship, except under the most favourable conditions, and then we know it can be done.

The Chairman: Gentlemen, we have had a very interesting paper and a very valuable discussion. It is always interesting to hear people speak who hold totally divergent views. We have had the advantage of hearing Baron Roenne's views upon the use of the airship, and we have also had the advantage of hearing the views of Mr. Grahame White, who is, I suppose, the most expert aeroplanist in the world, and who has expressed a totally different opinion to that held by Baron Roenne. I must say as regards Mr. Grahame White's remarks that his experience of an airship two years ago sounded very much like what the experience of an amateur, such as myself, might have been if I had been on an aeroplane ten years ago. We must remember, I think, that when we talk of aeroplanes we are talking of the present, but when we talk of airships, we are talking of the possibilities of the future. Those who have to deal with questions of that sort, such as the authorities of the Navy, must not preclude the future, because the present does not give absolute success.

PRACTICAL DIFFICULTIES.

A fascinating view was put forward as regards the number of aeroplanes that could be carried on board a ship. It was said that the aeroplanes could be sent out in numbers and then brought back again, on board the war vessel. I have no reason to say that that is not possible; but I would remind you of the analogy of the second-class torpedo-boat. One of the most fascinating theories in my younger days in the Navy was that of the second-class torpedo-boat, which was to be carried on board ship—one ship had eight of them. The idea was that when the ship got near the enemy, who might be in harbour, the torpedo-boats were hoisted out; away they went after the enemy's fleet, sank them, and then they came back again. The thing was apparently the simplest thing in the world. As a matter of fact, battleships were fitted to carry these boats, but within three years of the time when they were put on board battleships every single one of them was removed. The theory was perfect, but the practice was impossible. The delays caused by getting the boats in, the small breakdowns on the boats when they were away

made the whole scheme useless. In dealing with any of these questions we must be extremely careful not to express too definite opinions upon what may or may not be possible in the future. A thing may be possible or not possible; when it comes to be tried practically, the thing that appears to be very simple often becomes very difficult, and equally often that which appears most difficult turns out to be really a simple matter.

Although in no way wishing to detract from the value of aeroplanes to the Navy, under certain conditions, anyone who seriously studies the strategical requirements of the British Isles, due to their peculiar geographical situation in Europe, must inevitably arrive at the same conclusion as the Lecturer: that if the airship can be properly developed it is of considerably more use than the aeroplane as we know it now. I am quite certain that anybody who really studies the subject must come to that conclusion for very good reasons. It takes a good deal of looking into, but I think we may accept it as a fact. Prolonged endurance is necessary for prolonged reconnaissance; the air craft must possess the power of navigating accurately. The scout may be away for a considerable time at a considerable distance, in varying weathers, such as fogs, and he must keep his reckoning practically as accurately as is done on a ship, and that is one reason why there must be one, two, three, or four people in the same air vessel. If you want to get endurance of the craft you must have endurance of the crew, and to have endurance of the crew you must give them comfort. Mr. Grahame White has pointed out that he can fly himself quite comfortably for nine hours in an aeroplane, but if he has to do work and do it under bad conditions of weather, such as cold and exposure, he will not be in his normal state. If the men are to do their work thoroughly they must be comfortable. This was proved over and over again in the submarine boats. If the men are to keep in a normal condition you must make them to a certain extent comfortable, and that is one reason why some of us advocate a larger, more roomy, and better protected craft than the aeroplane, such as it is known now.

THE NEED FOR EXPERIMENTS.

The difficulty in the development of the airship lies in the fact that its commercial use is restricted, and the cost of experimenting with it is very high. So great is the cost that systematic experiments can only be carried out by philanthropists or by Governments. There is perhaps no class of work in which experimenting must be started so absolutely from the very commencement of design, since every portion of the hull material and fabric has to be invented and developed. Moreover, these special materials find little use in other commercial undertakings so that assistance from collateral sources of demand for similar material is non-existent. Unless we are to be out-distanced in the future by other countries in airship development, systematic and probably expensive experimenting will have to be undertaken in England, and the only people who can undertake it are the Government, and preferably the Admiralty. The urgency of the matter cannot be over-emphasized, since such development is not merely a matter of design, of shape, detail, etc., as was the case in submarine boats, but it entails the gaining of experience of materials and fabrics, all of which have to be experimented with. And since the composition and treatment of similar materials is certain to be kept secret by whatever country develops the airship, we may well wake up one morning and find that we are absolutely unable to produce what other countries perhaps have produced, because we have not got an elementary

notion or knowledge of the materials that we have to use, and therefore we may be without the slightest reply to what, if it is developed, will be a very formidable class of scout. It was considerations such as these which led the late Board of Admiralty to build an airship at Barrow. That airship was built entirely as an experimental platform. No one who knew the necessarily tentative nature of the work dreamed that the vessel would be more than a vast experiment on which to build future experience. No responsible person anticipated that the vessel would even leave her mooring post for at least six months after she was launched from her shed, during which time she could carry out her speed trials, which were very simple because it was only necessary to steam her to test her pace in varying strengths of wind, so that the whole of the speed factors and other information could be obtained in the same way as if she had not been attached to the mooring post. Experience would be afforded of weather conditions, mooring, leakage of gas, variation in weight due to varying hygrometer conditions, effects of aerial electricity, effects of variation of temperature, and deterioration of structure, which observations could only be carried out on a life-size model. These and numberless other experiments could have been carried out perfectly well at her post without her ever making a sensational trip. Unfortunately the vessel met with an accident at the commencement of her career, and has since not been publicly heard of. But that in consequence of this accident further experimenting in the direction of rigid dirigibles should be discontinued is inconceivable. A failure to achieve should only stimulate further exertion, and we may confidently look forward to increased activity on the part of the Admiralty, for if they allow the original experiments to drop it will be the first time on record that the Navy has run away from attempting to achieve because the attempt was difficult and courage was required to face temporary failure.

IMPORTANCE OF A FORWARD POLICY.

We must always be careful about *ex cathedra* opinions. I remember very well a very distinguished foreign admiral who stated that submarine boats were useless, and that they would never have them in his own particular navy. In less than three years that navy was supplied with submarine boats. That statement of his created a lot of harm; it produced a tremendous lot of opposition amongst influential people in England against submarine boats. It was always quoted. "So and so says they are useless, and they must be useless." That is one of the dangers we have to face when we are dealing with a problem of the future, that the man of the present is apt to damp the whole of the ardour, official or otherwise, by making too definite statements and failing to appreciate what after all may really be very great possibilities. If England is to make up her position in respect to airship construction, and not to be found deficient in the day of need, we require a forward policy of spending money, perhaps considerable sums, and a courageous sympathy among those in authority which will enable them to wait patiently until systematic and slow laborious experiment wins past uninformed criticism, and at last attains the success which cannot be withheld from unstinted and whole-hearted endeavour.

I am sure we ought to be very grateful to the author for bringing forward a paper so carefully thought out, supplied with such excellent diagrams, and upon which he must have spent considerable labour, and I am sure I am only echoing your wishes in according to him a very hearty vote of thanks for it.

AUSTRALIA'S TRANS-CONTINENTAL RAILWAY.

By H. K. ELLISON, Esq.

(Of the Intelligence and Information Bureau, Australian High
Commissioner's office.)

TO bridge the Continent of Australia by rail has long been the dream of the people of the Commonwealth. As early as 1894 a motion was moved in the South Australian House of Assembly for the sinking of bores and wells and the construction of tanks on the Western Australian route, as a preliminary for the construction of the Trans-continental Railway, but it was lost by a small majority. In 1901 mention was made in the speech of the first Governor-General (The Earl of Hopetoun) in the Federal Parliament, of the trans-continental railways in the following terms :—

Consideration of the important question of connecting by railway the Eastern States with Western Australia and of completing the line between Adelaide and the Northern Territory, together with the proposed transfer of the latter to the Commonwealth.

The building of this railway (East to West), which is a national question, was discussed at other times in the Federal Parliament. In 1907 a Bill had been previously introduced on two occasions, when it was once defeated, and once talked out in the Senate, but a measure to provide for a survey was finally passed appropriating £20,000 for the purpose. It was not, however, until December, 1911, that the Trans-continental Railway Bill (Kalgoorlie, Western Australia, to Port Augusta, South Australia), was finally passed.

As the urgent question of defence was again coming prominently to the fore, the Federal Government invited Field-Marshal Viscount Kitchener to visit the Commonwealth in this connection. A memorandum on the Defence of Australia was subsequently issued by Lord Kitchener, in which he said in reference to the railway system :—

I would also mention that railway construction has, while developing the country, resulted in lines that would appear to be more favourable to an enemy invading Australia than to the defence of the country. Different gauges in most of the States isolate each system, and the want of systematic interior connection makes the present lines running inland of little use for defence, although possibly of considerable value to an enemy who would have temporary command of the sea.

The War Railway Council of Australia owes its inception to Lord Kitchener, and paragraph 85 of his Memorandum on the Defence of Australia is as follows:—

Preparation for mobilization is primarily the work of the General Staff, who recommend the lines to be followed and advise where, and in what quantities, the munitions for war of the various units should be stored. Concentration can only be satisfactorily effected when the railway and military authorities are in the closest touch and work in absolute harmony. To secure this co-operation, I advise that a War Railway Council be formed, as is the case in the United Kingdom, composed of the Chief Railway Commissioner from each State, under the presidency of the Quartermaster-General of the Citizen Forces, and with an officer of the Headquarters Staff as secretary.

In August, 1910, the attention of all the State Premiers was drawn by the Prime Minister of the Commonwealth to Lord Kitchener's recommendation, and they were asked to consent to their Chief Railways Commissioner acting in the capacity suggested, to which request they agreed.

At the first meeting 20 resolutions were adopted, and it is interesting to mention two, of which one reads:—

In the interests of defence this War Railway Council affirms the desirability, as regards the main lines of communication, of a uniform gauge for the railways of Australia.

and the other:—

This War Railway Council recommends:—

(a) A uniform 4 ft. 8½ ins. gauge of railway linking up the capitals between Brisbane and Fremantle.

(b) A gauge of 4 ft. 8½ ins. on the Transcontinental line from Kalgoorlie to Port Augusta.

(c) That the cost of conversion be shared upon a basis to be determined between the Commonwealth and the States.

In connection with the question of gauge, it is of interest to recall that a statement had been made in Parliament to the effect that to transport 30,000 mounted troops equipped for active service from Melbourne to Brisbane would now take 63 days, whereas on uniform gauge, the time occupied would be only 23 days.

It will be seen that apart from the ultimate commercial value of the proposed line, it was deemed necessary from a defence point of view, and Australia was not slow to recognize this.

At present Western Australia is isolated from the Eastern States of the Commonwealth by over a thousand miles of rail-less land, and the voyage from Adelaide to Fremantle occupies about 4 days by sea, and is not a pleasant one during certain times of the year, and "rounding the Leeuwin" is usually long remembered. The loss of time (about 2 days) and the personal discomfort will be obliterated in about three years' time, when

it will be possible to travel from Perth across Britain's great White Continent to the Eastern States, and thence on northwards to Brisbane.

It was on the 5th September, 1911, at the opening of the second session of the fourth Parliament of the Commonwealth, that the Trans-continental railway scheme assumed a concrete form, and the following statement was made by the Governor-General :—

A Bill to provide for the construction of a Trans-continental railway with a gauge of 4ft. 8½ ins., connecting the West Australian railway systems with those of the Eastern States will be submitted for your early consideration.

This Bill was introduced and read for the first time in the House of Representatives, on a motion of the Minister

TRACK OF THE AUSTRALIAN TRANS-CONTINENTAL RAILWAY.



for Home Affairs, on the 20th September, 1911, which was couched in the following terms :—

That it is expedient that an appropriation of revenue and moneys be made for the purpose of a Bill for an Act to provide for the construction of a railway from Kalgoorlie in the State of Western Australia to Port Augusta in the State of South Australia, the

acquisition of the necessary land, the appointment of officers, the making of charges, and the appropriation of money, in connection with such railway.

Early in April, 1911, the Federal Cabinet had decided upon the 4 ft. 8½ ins. gauge for the Port Augusta-Kalgoorlie Railway. The Prime Minister pointed out that the immediate result would be a rather curious medley of gauges. In Queensland the gauge is 3 ft. 6 ins.; through New South Wales and Sydney to the Victorian border 4 ft. 8½ ins.; from the Victorian border through Melbourne to Adelaide and Terowie 5 ft. 6 ins.; from Terowie to Port Augusta 3 ft. 6 ins.; and from Port Augusta to Kalgoorlie it would be 4 ft. 8½ ins.; while the existing line from Kalgoorlie to Perth was 3 ft. 6 ins. The States immediately concerned—Western Australia and South Australia—would be approached at once and asked whether they would co-operate with the Commonwealth in making a uniform gauge through from Adelaide to Perth. Further extension of the uniform gauge system would be sought, but negotiation with these two States would be the first step.

It will be seen that the question of gauges is a matter of great importance in Australian railways, and it is of interest to remember that in April, 1897, the Premiers in conference in Adelaide decided to request the Railways Commissioners of the respective Colonies to report on the question. The Railways Commissioners of New South Wales, Victoria, and South Australia met in Melbourne in the following August, and furnished a report, in which it was pointed out that it would cost less to change the 5 ft. 3 ins. lines to 4 ft. 8½ ins. than the converse. In fact it has been estimated that this would mean a saving of over two millions sterling.

The question of the best uniform gauge again came to the front when the Engineers-in-Chief for Railways of the five States concerned were requested in 1903 to report upon the selection of the route for the connection between Port Augusta (South Australia) and Kalgoorlie (Western Australia) and its estimated cost. Here again the 4 ft. 8½ ins. gauge was recommended. At the first meeting of the Railway War Council in February, 1911, the Chief Railway Commissioners of the States being present, the question of gauge was again discussed, and it was unanimously decided to recommend the adoption of the 4 ft. 8½ ins. gauge for the Trans-Continental Railway. The House of Representatives adopted the 4 ft. 8½ ins. gauge decided by the Government, as against the 5 ft. 3 ins. gauge, after a lengthy debate, during which the opinions of experts were carefully considered.

It is a coincidence to note that in the second proposed trans-continental railway—North to South—the distance to be covered by the suggested railway from Pine Creek, the terminus of the Darwin Railway in the Northern Territory to Oodnadatta,

the terminus in South Australia, is 1063 miles, being the exact length of the span to be built on the East to West Railway, with which this article deals.

On the point of cost the following estimate was submitted with the report on the assumption that rails 70 lbs. to the yard would be used:—

	£
Clearing	16,000
Fencing	8,000
Earthworks	425,000
Bridges and Culverts	84,000
Rails and fastenings	1,012,000
Sleepers and ballast	1,038,000
Platelaying	153,000
Water supply	456,000
Station yards (including telegraph equipment, terminal accommodation at both ends and workshops and machinery)	335,000
Maintenance for 12 months	93,000
Rolling stock	315,000
Land Purchase	10,000
Engineering and supervision	100,000
	<hr/>
	£4,045,000

By reason of boring for water and adopting a cheaper method of conveying it to distances along the line—by using wooden stand pipes instead of steel, the item Water Supply can be reduced from £609,000 to £456,000, if steam locomotives are used, or say to £250,000 if internal combustion engines are used instead. The question of internal combustion engines is very much to the fore at the present moment in this country, and it will not be surprising if more is heard in the near future.

For the construction of the line the two States immediately concerned, South Australia and Western Australia, have passed the necessary legislation giving the Federal Government the power to build the line through their respective States. The Trans-continental Railway Act, 1911 (No. 6 of 1912) of the State of Western Australia is

An Act to consent to the construction by the Commonwealth of Australia of the Western Australian portion of a railway from Kalgoorlie to Port Augusta; and to enable the Governor to grant such waste lands of the Crown in Western Australia as are required for the construction, maintenance, and working of such railway.

This Act was assented to on 9th January, 1912. Likewise in South Australia the Trans-Continental Railway Land Grant Act, 1911, No. 1069, which was assented to 4th January, 1912, made it lawful for the Governor to grant lands not exceeding one eighth of a mile in width on either side of the railway.

An interesting feature in connection with the Trans-Continental scheme may be cited, this is, that only about six bridges of any importance will have to be built, though there are several smaller spans, but these will not involve large expenditure.

The route to be taken by the East to West Trans-Continental Railway traverses various types of country. It is thought that some of the districts through which it is to pass may prove quite suitable for agriculture, while many million of acres can be considered favourable for pastoral development. The world at large is familiar with Australia's mineral wealth, of which only a fraction has been extracted. Who knows what wonderful discoveries may be made, indirectly through the building of this vast railway? It is claimed to be the biggest of its kind in the world, as never before has over a thousand miles of railway been built in a single undertaking across any continent.

The initial work at both ends of the line was started in May. The Governor-General will turn the first sod in July, and probably there will be great national celebrations on the occasion of the opening of the railway in the summer of 1914-1915, when it is anticipated the railway will be ready for traffic. Australia will then not only act and think imperially, but she will be able to move imperially, and with a greater sense of national security.



THE STRATEGICAL ACTION OF CAVALRY.

By Brig.-General H. DE B. DE LISLE, C.B., D.S.O.

On Wednesday, April 24th, 1912.

Major-General E. H. H. ALLENBY, C.B., Inspector of Cavalry, in the Chair.

INTRODUCTION.

THE employment of cavalry in war may conveniently be divided into the strategical and tactical action of this arm.

The strategical action embraces those services prior to the meeting of the two main armies, when the cavalry, with or without support, acts independently under the direct orders of the Commander-in-Chief on a special mission. This mission may be reconnaissance, or the acquisition of information about the enemy or the country in that particular zone of operations; or its mission may be to hamper the enemy during concentration; raids against his lines of supply; or the cavalry may be used to mystify and deceive the enemy as to the probable plans of its own forces.

Of these various strategical missions, that of reconnaissance is undoubtedly the most important.

Frederick the Great is reported to have said:

"If we could be acquainted beforehand with the enemy's plans, we would always be able to defeat him, even with an inferior force."

Reconnaissance, or the means of acquiring information, is performed by cavalry in two distinct ways: by stealth and by force.

Reconnaissance by stealth may be carried out by scouts or patrols who avoid meeting the enemy; but approach secretly and report his movements. These small parties are usually supported by formed bodies which collect and transmit all information, and are called reconnaissance or contact squadrons or troops.

Reconnaissance by force becomes necessary when such squadrons are not strong enough to go forward against any opposition which may be met.

Although reconnaissance by small bodies, if used expertly, may achieve excellent results, these will seldom be able to acquire the more important information, as the hostile army will certainly protect itself from such inquisitive parties by a screen of detachments which can only be torn aside by force.

As to the means of obtaining information by force, there exists a wide difference of opinion, and two distinct schools of thought; those who favour the principle of using all available cavalry for exploration; and those who consider this method unsound, and recommend the employment of a proportion of the available cavalry only, and that this should be supported by a force of all arms.

Our regulations are definite on this point; the view expressed in them being that some cavalry will be required for protective purposes, but that as strong a force as possible should be detailed for exploration, and made "Independent Cavalry" for that purpose; the term independent being defined as meaning "relieved of protective duties."

Strategical reconnaissance or exploration by the Army cavalry infers the massing of as strong a force of cavalry as possible under one commander, in the hope of its being able to brush aside any resistance that may be encountered in advance of the enemy's main columns.

This principle has, since 1870, become very popular with military writers on cavalry, and, provided an undeniable superiority in cavalry is assured, it would appear quite logical to make the most use of it in this way.

This doctrine, for which Germany is responsible, has been generally accepted by other European nations, including our own; and though several French writers have recently expressed doubts on the efficacy of the system when applied to an army with a weaker cavalry, their recent regulations appear to follow the popular fashion of the day, and deficiency in strength is to be minimized by cyclist supports.

EXPLORATION BY THE ARMY CAVALRY.

Let us consider for a moment the arguments in favour of exploration by the whole available army cavalry.

1. History proves the enormous importance of reliable information, and that such information must be fought for if it cannot be obtained in any other way.

Before committing his forces to any definite plan, the Commander-in-Chief will require reliable information of the enemy's dispositions, his places of concentration, or the direction of march of his forces, and the nature of the country between the two armies. For this information he trusts to the commander of his independent cavalry.

On receipt of his instructions, the cavalry commander moves his force in the direction in which it is desired to reconnoitre. There he may meet the bulk of the hostile cavalry, and if so, on his success against it will greatly depend his ability to acquire information. If he is able to establish his superiority over the hostile cavalry, he can drive its disorganized units back on to the hostile infantry, and will then be in a position to discover all he wants to know. If defeated or forced

to retire, owing to weakness, moral or physical, his cavalry will not be able to operate in the presence of the hostile cavalry without the support of the protective cavalry or of infantry detachments.

2. If successful in the cavalry duel, the independent cavalry will be able to force its way up to the enemy's protective line, which it will endeavour to brush aside, or, as it is sometimes expressed, to tear a rent in the hostile protective screen. Through this opening or rent, special scouts or patrols will be sent forward to reconnoitre the enemy's main columns.

In the meantime the independent cavalry will be fully engaged. The enemy will endeavour to close the gap, concentrating all available troops in the vicinity for this purpose.

On the other hand, the independent cavalry must endeavour to keep a passage open for the withdrawal of the patrols who might otherwise be unable to return, or be so much delayed that their information, when received at headquarters, would have lost its value.

Having accomplished this mission of exploration, the independent cavalry will be available for other duties, but will keep touch with and closely watch the enemy.

3. It will be noticed that the defeat of the enemy's cavalry, though only a means to an end, becomes almost a necessity if both are operating in the same zone, and though reconnaissance is the primary object, the importance of overwhelming the enemy's cavalry and establishing the superiority of one's own can hardly be exaggerated, for this may decide the eventual issue of the campaign.

Much has been written about the cavalry encounter during the past few years, and the best way of defeating the hostile cavalry. The means used must depend on circumstances, and especially on ground. If the latter is favourable to a mounted attack, there is very little doubt that shock tactics, supported by the fire of horse artillery and machine guns, will be employed; and in all European Armies cavalry is being trained in masses to defeat hostile cavalry masses.

To endeavour to overwhelm the enemy's cavalry by means of fire action only would take far too long, and the delay would militate against the fulfilment of the primary object: to gain information of the enemy's main columns. Moreover, such actions usually produce indecisive results.

If large forces of cavalry meet, the duel will extend over a considerable front, and unless the ground is very exceptional it may be expected that parts of it will favour fire action, and if so, a combination of fire and steel will be seen on the same field. In 1863, at Brandy Station, in Virginia, we have an historical example of the combination of fire and shock on the same field. Ten thousand cavalry on either side fought for ten hours; in the end the Federal force retired, but the victory was in no way decisive, and the results may be said to have been almost negative.

Although a decisive and quick victory is wanted, it is now generally admitted that it will often be advantageous to employ the fire action of dismounted portions of the cavalry to prepare the way for the mounted attack, and when the nature of the country necessitates the employment of dismounted action. The object to be attained is not only to defeat, but also to cripple the enemy's cavalry, and the quickest and best means to this end will be employed.

Of all military subjects, there is none which has excited so much interest or so much acrimonious discussion as the employment of cavalry. The controversy is not new, nor is the prominence given to it in the past ten years in any way extraordinary. It recurs periodically, and has done so for the past 200 years.

Science is progressive, and must be met by changes in tactics and organization. We cannot afford to ignore the increased power of modern weapons; but we must not fail to realize that the moral qualities of the man behind the gun remain the same. It is even reasonable to estimate the value of short service soldiers of the present day considerably below those of 100 years ago, who made soldiering a life-long profession.

In recent years, there has been much intemperate matter written on this subject, and even eminent military writers of the various great Powers have raised doubts as to the possibility of great cavalry successes in future wars. Such views have roused intense irritation in the minds of others who hold entirely opposite opinions. Nevertheless, our present ideas on the tactical employment of cavalry have been evolved by the amalgamation of such opinions, tempered by war experience, and the true appreciation of the constant factor, the man behind the gun.

In face of the acute feeling which prevailed in all European cavalry on this question during the past decade, it is most interesting to refer for a moment to that excellent article on "Cavalry Tactics," written for the *Times Encyclopedia Britannica*, of 1903, by that shrewd and able writer, the late Colonel Henderson. In this article, he reviews the history of cavalry, and asks what modification is necessary to meet the altered conditions of modern war? "The answer," he writes, "comes from across the Atlantic. The American cavalry, owing to their native ingenuity and the length of the war, solved the problem. It could charge home with the sabre or revolver. In addition, it was so equipped that it could fight on foot as readily as in the saddle, and it was so armed and trained that when dismounted it was but little inferior to the infantry."

This article, written during or shortly after the South African War by Colonel Henderson, is remarkable in that he foresaw what it has taken European military experts some years to realize, that the successful handling of cavalry depends on appreciating at their true value the advantages of fire and steel.

OBJECTIONS TO RECONNAISSANCE BY ARMY CAVALRY.

The opponents of the modern conception of the strategical exploration by the army or independent cavalry hold just as strong views against this method as those who advocate its use hold in favour of it. Although the majority of writers in favour of the independent cavalry idea are themselves cavalry officers, a fair proportion of those who oppose them also belong to this arm. The cavalry officers who oppose the exploration by the army cavalry, do so chiefly on the ground that they think cavalry is far more important for co-operation in the battle, for pursuit, or in retreat, than in the services of acquiring information which can be procured in other ways: by secret service agents, by reconnaissance by stealth, and by aerial scouts.

Several eminent French military writers such as Bonnal, Foch, Foucart, and others, hold very decided views on reconnaissance by force, but not by cavalry acting independently.

Their arguments may be summarized as follows:—

1. The independent application of force is not admissible in a strategical sense, and to risk the annihilation of one's cavalry, operating without support, is held to be as unsound in strategy as to risk the defeat of an army by attacking in detail without mutual support.

2. The doctrine of exploration by the army cavalry cannot be said to have received proof in the test of war, and until verified must be looked upon as unproven. It cannot be said to have been proved in 1870, for the Germans at the beginning of the war used their cavalry as protective cavalry only, until the French cavalry had lost all power of organized resistance. We cannot admit that it was tested in South Africa or Manchuria. In the last campaign, the victors, being weak in cavalry, used it for protection only. This is the course recommended by the late General de Gallifet, who held that if the effective strength of cavalry is not sufficient to divide into independent and protective, it must be kept for the latter duty. It is only fair to add that the large numerical superiority of the Russian cavalry appears to have been discounted by want of capable leaders. The Japanese, however, do not appear to have suffered from want of accurate information in spite of having had no cavalry for exploration, and of having trusted to an excellent secret service instead. Their want of a cavalry reserve, however, was much felt, and prevented them reaping the fruits of victory.

3. In view of the fact that Napoleon kept his cavalry in reserve, and for special missions, and that the modern idea of the employment of strategical cavalry still requires to be proved by war, this method is held to be only a temporary innovation which will soon change again to those of Napoleon, the great

master of war, who knew more about the use of cavalry than anyone before or since.

USE OF CAVALRY BY NAPOLEON.

Let us consider for a moment how Napoleon used his cavalry for strategical purposes in advance of, or detached from, his army.

We find him following no doctrine or general theories, but using his cavalry for special purposes, giving very clearly defined instructions on each occasion. Not once did he send all his cavalry reserve on a vague mission of exploration. He sent only so much as was necessary to a defined place, and specified exactly what he wanted the cavalry to do.

In 1805, he sent it across the Rhine as a screen to deceive the enemy, and when the Grand Army executed its turning movement on Ulm, this cavalry, supported by two Corps, acted as a flank guard. On the 2nd October, the Emperor wrote to Murat—"You will protect my flank as I move obliquely to the Danube, which is a delicate operation. If the enemy intends to take the offensive, I must be warned in time to take action, and not be obliged to conform to that of the enemy."

Finally, after the capitulation of Ulm, when the Army was moving on Vienna, the same cavalry was sent on in advance, supported by Infantry Divisions, to seize successively the crossings of the Inn, the Salza, the Traun and the Ips.

In 1806, in the Jena Campaign, the cavalry having crossed the Frankenwald, it was sent rapidly to the Saale (supported by Bernadotte's Corps), whence reconnoitring detachments were sent on to Leipzig.

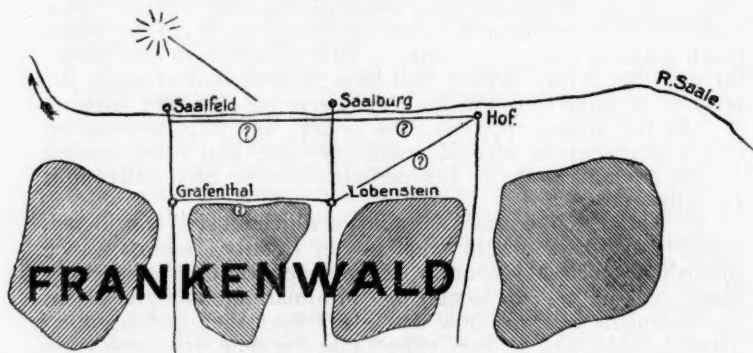
To gain a proper idea of the definite nature of the orders Napoleon issued to his cavalry we must refer to his letter to Murat, dated 7th October, 1806.

This letter is remarkable not only for the very definite nature of the instructions sent by the Chief of the General Staff to Field-Marshal Murat (Duc de Berg), but also for the manner of dealing with the demand for information. It deserves to be studied by all leaders in the field with cavalry under their orders. This arm has often had to bear the blame of any want of success in reconnaissance, but the cause has usually been due to the indefinite nature of the instructions issued to it.

At the beginning of the Jena Campaign, Murat, with three cavalry brigades and the First Corps (Bernadotte), formed the General Advanced Guard. The position of each cavalry brigade, and the 1st Corps, and the strength of the Cavalry Reserve and its position, were all laid down. As regards reconnaissance, Saalfeld, Saalburg and Hof were mentioned as the points of direction and allotted to Milhaud, Wathier, and Lasalle's Brigades respectively. An engineer officer was to be attached to each of these Generals to report specially on the country and roads. These three places on the River Saale are

all 25 miles apart, and the foregoing instructions might have been thought sufficient when addressed to a Field Marshal. Napoleon, however, specifies what information he requires in the form of questions, as follows:—

- (i) "Is communication possible between Saalfeld and Saalburg?"
- (ii) Is communication possible between Saalburg and Hof?"
- (iii) Is communication possible between Lobenstein (10 miles in rear of Saalburg) and Grafenthal (10 miles in rear of Saalfeld)?"
- (iv) Is communication possible between Lobenstein and Hof?"
- (v) What are these roads like?"
- (vi) Are they fit for Infantry, for Cavalry and Artillery?"
- (vii) What is the position of the enemy about Hof, about Saalburg, and above all on the main road to Leipzig?"
- (viii) What is its position about Grafenthal and Saalfeld, that is to say between Coburg and Naumburg?"



Could anything be more precise? Such questions indicate clearly on what points exact information is required, and enable the Cavalry to direct its energies towards solving the answers, and not to waste energy in any indefinite service.

A further remark with reference to his reconnoitring detachments. These were generally strong parties from 100 to 200 sabres, specially selected for ability from volunteers, and largely composed of non-commissioned officers. Being all specialists and led by the best officers, they were able to achieve far more than the ordinary contact squadron. Moreover, these detachments were usually supported at a short distance by the rest of the regiment and even by a brigade. The reconnaissance

was, therefore, of a telescopic nature, such as was sometimes used by us with success in South Africa.

Napoleon himself originated this form of reconnaissance when he wrote to Lannes in 1805, "Marshal Lannes," he writes, "will remain to-morrow at Rastadt, extending if necessary to Baden, and will send cavalry reconnaissances as far as Wildbad. These will start before daylight. Two regiments will proceed six miles, the third another six miles, one squadron three miles further and a patrol on the best horses the last three miles."

Later on, when the superiority of his cavalry was established, such precautions were dispensed with, but in all his campaigns he was able to acquire accurate information of the enemy's forces, while masking his own movement by means of impenetrable screens.

4. To resume the arguments against the cavalry exploration, some writers hold that however important it is to acquire information of the enemy, reconnaissance by force, unless successful, will damage the *moral* as well as the effective personnel to such an extent that a defeat of the Army cavalry may lead to a defeat of the Army.

5. Even if successful, the loss in men and horses and the fatigue of the remainder must lower the fighting value. Long distances must be covered before the independent cavalry gains touch with the enemy's columns, a fight is certain to take place; for days the Army cavalry will have no rest, and at night the services of protection will be very severe on men and horses.

As the armies approach, the cavalry will have to clear off to a flank, often at a considerable distance, and when wanted in the general battle or for pursuit, may be physically unfit for this work.

6. Aerial reconnaissance is a factor which must be considered, though no writer would wish to see cavalry reconnaissance abolished on this account. Aeroplanes cannot be entirely depended on yet for acquiring information, though recent developments tend to show that every year they are becoming more reliable, and we may expect that the time will come when cavalry will be used more to verify information acquired by Air Scouts, than to procure this information primarily.

7. There is a tendency among several military writers to think that the duty of confirming reports of aerial reconnaissance might be entrusted to the protective cavalry, which is already responsible for close or tactical reconnaissance, and with little more fatigue could push their reconnoitring detachments further to the front. This would leave the Army cavalry in the hands of the Commander-in-Chief for special missions, such as operations against communications, screening a manoeuvre, for co-operation in the general battle, for pursuit or to cover a retreat in case of a reverse.

8. In the case of the weaker cavalry, these arguments apply even more forcibly, and one writer describes in detail

the possible effect of this last suggestion against the enemy's stronger Army cavalry used in exploration.

He imagines the former Army marching on a broad front with columns five to ten miles apart, covered by advanced guards of all arms, and the first line of security formed by the protective cavalry. This again is covered by a line of reconnaissance squadrons about 15 miles apart with their patrols in front, each squadron supported by a company of cyclists.

From the head of the columns to the patrols would certainly be 25 miles and might easily extend to 50 miles.

As the hostile independent cavalry advances in a concentrated formation, also marching on several roads, it would be reported by the patrols, and meet with some resistance on reaching the line of squadrons with their cyclist supports. More delay would occur at the line of the protective cavalry which would normally fall back on the line of the advanced guards.

In the meantime those reconnoitring squadrons not held up by the independent cavalry would continue to push on to acquire information by stealth.

On reaching the infantry advanced guards, the independent cavalry would have to fight in order to break a rent in the protective screen, and this fight would necessarily be a serious affair and on a comparatively wide front, necessitating an extensive dismounted action.

It is at this point that the Commander-in-Chief of the Army attacked would have a favourable opportunity of using his reserve cavalry with signal success. While the hostile independent cavalry has been marching for days, on outpost at night, and continually engaged for at least 24 hours, the other reserve cavalry has been kept in hand, and billeted in rear of the outpost line. Tactical reconnaissance would have placed at the disposal of the latter cavalry commander all details regarding the country, and about the hostile cavalry mass. Although the weaker cavalry, his would be stronger than the mounted reserve of the enemy, and if the latter were attacked with rapidity there would be no time for the latter to withdraw from the fire fight the units already dismounted.

Should the force which keeps its cavalry in reserve employ a general advanced guard, the risk to the hostile army cavalry would be even greater. It must either attack the general advanced guard or pass it by. In the latter case, it might find itself held up in front by local advanced guards, attacked on both flanks and even its retreat cut off by the reserve cavalry pushed out for that purpose, assisted by the general advanced guard.

9. The writers I have quoted fully admit that with the stronger cavalry, the German doctrine regarding its employment is perfectly logical, but do not approve of the weaker cavalry being sent out unsupported to meet it, with every chance of being over-

whelmed, and so being useless for the time it will most be required, during and after the battle.

There appears to be much worth considering in these arguments, which are founded on the importance of maintaining at its highest fighting value a large cavalry reserve for use during and after the battle.

COURSES OPEN TO THE WEAKER CAVALRY.

At the same time, these ideas do not solve the difficult problem, how to employ successfully the weaker cavalry against the stronger. If the weaker cavalry is never to risk defeat, it will rapidly lose its fighting value, and become useless in the hands of the Commander-in-Chief. We have many historical examples of cavalry sheltered behind the infantry outposts until it was unfit to act alone.

From the first, therefore, cavalry must learn how to maintain its own security even when opposed by a stronger force of this arm.

There are several ways open to the weaker cavalry. The rifle in the hands of the cavalry gives it a defensive power never yet possessed, and a delaying power still hardly realized. It is true that in the open country, other things being equal, the numerically stronger cavalry will probably win, and may even achieve a very decisive victory. The weaker cavalry will be wise, therefore, to advance by a line more suited to the use of the rifle than the sword, pushing its own protective reconnoitring detachments sufficiently far to the front and flanks to give the main body of the cavalry time to reach a suitable position where its numerical inferiority may be compensated by the advantage derived from the ground.

If the proportional strength of the two cavalry forces is very marked, the weaker must be supported by strong bodies of infantry, one or more divisions following as a *point d'appui*, on which to fall back if hard pressed, or with which a forward movement may be carried out.

This combination partakes of the nature of a general advanced guard, a form of reconnaissance which was often used by Napoleon.

The action of a force of this nature has not received as much attention in this country as it deserves, and as far as I can discover we have no military literature of a recent date to assist us.

We have, nevertheless, an interesting and recent example of our own in which the whole of our independent cavalry was closely supported by a division of infantry. The example to which I refer, one closely studied by foreign critics, is that of the relief of Kimberley by General French's cavalry division.

We are inclined to look on this only as an incident of which we are proud. Foreign writers, however, regarding it from a military aspect, describe it as a brilliant feat of arms.

To have turned a defence, and not altogether a successful defence, into an offensive attitude is always a difficult feat in war, and on this occasion the way Field Marshal Lord Roberts massed his cavalry for a strategical purpose, supporting it with the 6th Division, is looked upon as a masterly act which saved the nation from disgrace, and proved to the world that the national character of dogged tenacity of purpose still exists.

CAVALRY IN BATTLE.

There is also a wide difference of opinion among military writers regarding the employment of cavalry in co-operation with the remainder of the Army in battle. Some think cavalry can be and should be used on the system that Napoleon adopted. Others believe that modern weapons will make this impossible, and think that the cavalry should assist their infantry in the firing line. Our own Text Book advocates the massing of the cavalry under the orders of the Commander-in-Chief for the moment when it can be slipped with a reasonable chance of success, and indicates a flank as a most suitable situation for it.

All great leaders have made the best use of their cavalry, and we cannot do better than consider Napoleon's method for a moment. He had the utmost faith in cavalry during the battles but he bound himself by no doctrine. "Cavalry charges," he wrote, "are equally effective at the beginning, in the middle, and at the end of the battle."

At the same time his usual custom was to reserve the cavalry for the great culminating blow, or the "evénement" when the enemy had used up his last reserve.

Sometimes he massed his cavalry on a flank, sometimes in the centre, and sometimes it was even distributed along the line. At Austerlitz, he placed the whole, except that of the Imperial Guard, on the left flank, under Murat. At Eylau it was concentrated in the centre; and at Friedland it was distributed in four groups, but that on the left flank was strongest and consisted of two divisions.

His faith in the importance of a strong cavalry is evident. In 1806, his cavalry was 65,000 strong out of a force of 325,000, or in the proportion of one to five. Later, on being dissatisfied with the strength of his cavalry, he raised it to nearly 100,000, both officers and men being carefully selected.

It is no exaggeration to say that his successes during the years that the French Army was at its zenith were chiefly due to his excellent and numerous cavalry.

At Marengo, it was the charge of a few squadrons under Kellerman which converted a disaster into a decisive victory, and brought about the capitulation of the Austrians under Melas.

At the battle of Austerlitz, it was his cavalry under Murat which, by repeated charges, enabled Soult and Bernadotte to

reach the plateau of Pratzen; and afterwards it was the famous charges of Rappe and Bessières, with the Cavalry of the Guard which broke the counter-attack of the allies and completed the victory.

At Eylau, the 80 squadrons of Murat decided the issue of the day, piercing the centre of the Russians when the French centre was threatened by them.

At Essling, the repeated onslaught of the cavalry divisions under Lasalle, Espagne and Nansouty enabled the two corps under Lannes and Massena, some 30,000 strong, to maintain a defence for a whole day against the Austrian Army of 80,000 men.

At Wagram, at Borodino, it was again the cavalry which decided the victory.

On the contrary, at Lützen, Bautzen, and Hanau, when the Imperial Army had been deprived of the bulk of its cavalry, the French certainly won the fights after considerable difficulty, but were powerless to make victory decisive, or to reap the advantage such victory should bring.

In spite of the fact that we have no historical examples of decisive victories without the assistance of cavalry during and after the battle, and many examples of the converse, the question as to whether the same thing will be possible in the future must remain unanswered until the next great war.

In my own mind, I am confident that a cavalry like the cavalry of Napoleon, comprising the most dashing officers of the Army, and men, who, on numerous battlefields, showed the most supreme disregard of death, will still be able to achieve the same brilliant results.

POINTS IN FAVOUR OF THE CAVALRY RESERVE.

1. When we read the account of the campaign in Manchuria, we find Infantry on both sides, without ammunition, fighting hand to hand, and even using stones as missiles. So much ammunition is now used, and the difficulty of replenishing it is so great, that we may expect to find armies in the future, towards the end of the battle, facing each other, but unable to bring matters to a conclusion for want of it.

2. Another point in favour of the Cavalry Reserve is the fact of the youth and inexperience of modern armies. Veteran soldiers, with confidence in their officers and in their own steadfastness, may be trusted to remain firm in the face of a cavalry onslaught. It is very doubtful if continental armies of one and two year men, who have no experience of war, can be expected to behave as well, and the threat of a cavalry charge may produce a panic.

There is a point, however, which, like other countries, we are also inclined to overlook. Cavalry, to be successful, must be led by fearless commanders, and such commanders of cavalry should be young. The success of Napoleon's cavalry

was, in a measure, due to the youth and personality of the leaders. Take, for example, the French Cavalry Corps, which, from 1807 to 1812, Napoleon used as his Cavalry Reserve. Murat was in command, Lasalle commanded a division, and after his death was replaced by Montbrun; Colbert was one of the brigadiers. Of these famous leaders, Montbrun was the eldest, and he was under 40 years of age, and Lasalle was only 35. Their personality, however, was more remarkable than their youth. Their disregard of danger or losses, provided they carried out their orders, permeated down to the junior ranks, and made their cavalry invincible, until the snows of Russia destroyed it.

Then consider their disregard of losses. The German cavalry in 1870-1871 lost 3,000 cavalry out of its total strength of 63,000. Napoleon at Eylau and Essling alone lost 2,000 cavalry in those famous charges. With well handled cavalry, losses in battle are no bad test of bravery.

3. Then again, we must consider the increased moral depression which takes place during a modern battle. It is a far greater strain to submit to hostile fire when unable to see or reach the enemy.

Most of us have seen something of this in our small wars; cases of men being utterly prostrated after lying in the open for 12 hours and being sent to hospital in a state of physical collapse. We have also witnessed cases of panic caused by the possibility of a charge of savages armed with spears. We read of similar cases of physical exhaustion and panic in 1870, during the American War, and in the small wars in Algeria. This will always occur in war, and the younger the troops the more easily will they give way to the strain, or to the instinctive fear of cavalry.

It is on such occasions a well led and intrepid cavalry may find a favourable opportunity for a great success.

4. The idea of using the Cavalry Reserve to strengthen any weak part of the firing line is no doubt very attractive, as its mobility enables it to move to any weak position in so short a time; but we must remember that once committed to the firing line, cavalry cannot be used for any other purpose. Even in case of a victory, to re-organize it for pursuit will take much time, and this loss of time may be fatal. Moreover, unless fresh, men and horses will succumb to the fatigue of pursuit, which is more exhausting than any of their other duties.

To discuss the question of raids, and the means which cavalry employs for mystifying the enemy, would take up too much of your time to-day, and curtail too much the discussion which I hope will follow my lecture.

I have discussed cavalry in reconnaissance, acting either independently or as part of a General Advanced Guard, and cavalry in co-operation with other arms during and after the battle.

These are the chief duties of cavalry, and the commander who possesses an arm proficient in these will find himself not only relieved from his chief anxiety, but will soon realize that the spirit of intrepid self-sacrifice of this arm will raise the moral of his Army, and enable it to succeed against an enemy, numerically stronger.

We who have faith in cavalry are confident that the next great war will confirm the truth of the famous remark of Frederick the Great, "*In war success depends on the superiority of one's Cavalry.*"

Points Suggested for Discussion.

1. Assuming the proportional strength in Cavalry to be approximately the same in both armies, is the exploration by the whole Independent or Army Cavalry strategically sound?
2. With a weaker Cavalry Force should it be sent on exploration without support?
3. Assuming aerial reconnaissance to be an established fact, is it advisable to transfer the duty of distant reconnaissance to the Protective Cavalry, so as to maintain more Cavalry in reserve for use during and after the battle?
4. During the battle should the Cavalry be kept in reserve, or used to assist the Infantry in its struggle for fire supremacy?

DISCUSSION.

Col. Sir P. W. Chetwode, Bart., D.S.O., Commanding London Mounted Brigade: said that they had all listened with the greatest pleasure to the lecture because it was a subject of vital importance to them, and particularly so to officers of other arms who were present, who would have to deal with them in mixed forces; but he was rather disappointed that General de Lisle had not come to any definite conclusions himself. He had devoted practically the whole of his lecture to enumerating the apparently hopeless disadvantages of using cavalry to reconnoitre strategically, while he had devoted a very short time to the opposite view of the case. If he might venture to say so, he thought that whether they used their heavy masses of cavalry for strategical exploration or not did not depend on doctrine or theories, but on expediency alone. It was for the General to decide whether it was worth while doing it or whether it was not; and if he considered that the object to be gained was vital to the success of his force, he might obviously take the greatest risk and employ cavalry for reconnoitring strategically; because, though it would undoubtedly be very unfortunate for him too if he entered upon a battle with his cavalry shaken, or not in the condition in which he hoped they would be, yet surely this was a much less serious disadvantage than it would be to enter upon that battle without knowledge of the position of the enemy's heavy columns, and so on; a knowledge which was essential for success.

INFORMATION IN WAR.

He disagreed with the view expressed by General de Lisle when the latter said, "*Before committing his forces to any definite plan the Commander-in-Chief will require reliable information of the enemy's disposi-*

tions, his places of concentration, or the direction of marching of his forces, and the nature of the country between the two armies." He thought they would agree with him that if a commander expected all that information before he had even formed a plan of campaign, he was expecting vastly more than he would ever get in war; and, unless he entered upon a war with a fixed plan of campaign in his head, and determined to impose his will on the enemy, and not adopt the attitude which the paragraph rather pre-supposed (*i.e.*, a defensive attitude in which he was prepared to parry blows and take his chance of getting one in, instead of forcing his own will on the enemy), he did not think the best cavalry in the world would supply him with such information as that in time for him to act upon it. He was quite with the Lecturer in supposing that in the next big European war they would not want half so much strategical reconnaissance as people seemed to think. The campaign would be conducted on an enormous front, and it would be quite impossible to reconnoitre strategically all along it; but every Commander-in-Chief, in the next European war, would enter upon the campaign with a very large degree of information about the enemy already in his hands. It was obvious that his Intelligence and his General Staff would be able to supply him with the principal points of concentration, which were indicated by the termini of the strategical rail heads, and so on, and he would know a great deal about the order of battle of the enemy; and, above all, he would have his own appreciation of the probable course the enemy intended to take. He thought their business in the next great war would be, not general and vague strategical exploration, but to confirm the Commander's appreciation of the probable action of the enemy. And in order to be able to act properly they would have to be told their Commander's view of what he thought the enemy was going to do. He did not think it would be the least use for him to enter upon that campaign without an absolutely clear idea in his own head of what he was going to do, and a fixed determination to impose his will on the enemy.

Lieut.-Colonel M. L. MacEwen, 16th Lancers: said that a question of vital interest to them was the action of an inferior force meeting a superior. It was one they would have to face if they crossed the water, and it had occupied the attention of the French Army for a long time.

The points that required closest study were:—

Firstly, the characteristics of the enemy and the lines of training adopted by him. Now the German doctrine was that of "superior numbers;" their motto was "attack always, anywhere, anyone," with the full weight of all their forces from the start. The French proposed meeting this by "parry and return," in other words, "hold and check the enemy in front till his action develops. Adopt a deep rather than a wide formation, and when the moment arrives, by use of reserves, gain superiority at the decisive point, though inferior over the whole field of battle."

Secondly, cavalry in the strategical rôle. The cavalry might find its advance barred by superior forces of enemy's cavalry. It might wish to fight to cover the launching of its reconnaissances, under cover of the enemy's concentration. It would have to tear aside the veil of the enemy's protective troops and hold the rent open to get the information required. It would suffer greatly in mobility from arduous outpost and other duties. The defeated cavalry would have to fall back on and get support from

its own infantry, and the victorious cavalry would experience the greatest difficulty, owing to its lack of penetrative powers, in reaping the fruits and gaining the information sought. The French had experimented with a cyclist support for their cavalry, to counteract numerical inferiority, and the co-operation of a cyclist battalion with a cavalry division had proved a great success.

The Germans anticipated using masses of cyclists to help to penetrate the enemy's protective screen after the cavalry decision had been reached. But while cyclists might solve the difficulty as regards small forces, infantry in considerable strength would be required for the strategical reconnaissance, and they might yet see a British Light Division working in support of the cavalry.

Thirdly, a visit to Belgium would show a country well suited to cavalry work, but to work, in which the rifle would play a more important part than on Salisbury Plain. The farms, woods, and villages formed invaluable tactical points, for use in the offensive as much as in the defensive, and the intervening country was suited to mounted action. A close study of the use of these tactical points, and of how their occupation by rifle fire would affect both sides was, he considered, essential to their training.

General Sir E. P. Leach, V.C., K.C.B., K.C.V.O.: I shall be very glad to say a few words, mainly because the Lecturer many years ago served under me, and I have watched his career since that time, 1886, with the greatest pleasure. When you ask an engineer officer to speak upon cavalry matters, he naturally demurs, but I have listened to and read the paper with very great interest. One speaker has said that General de Lisle has expressed no individual opinion on the various points discussed, but I think you may read "between the lines" of the lecture, especially where he says that he personally holds such and such an opinion, and states his conviction, which you cavalry officers will all, I am quite sure, share, that there is a very great future before cavalry acting in its legitimate rôle, and using not only the *arme blanche*, but, when occasion requires, the rifle.

I strongly agree with his contention that, in the possible event of our being involved in war with a Continental Power, and in view of the numerical inferiority of our cavalry, our officers should be trained to take advantage of positions of ground which would enable them, in case of necessity, to fall back upon other arms.

That they will have opportunities of occasionally using the rifle need hardly be impressed upon you. But I think that cavalry as cavalry should hesitate before they dismount to any great extent; and that they should look to that power, which the fact of their being mounted gives them, to take prompt and energetic action. I am sure that all cavalry leaders will agree with this, that if you hold cavalry too much in reserve and do not use them, the men, after a certain time, will lose *moral*, and will lose that sense of initiative which ought to be the leading quality in all good cavalry.

Colonel E. A. Herbert, M.V.O., Commanding Welsh Border Mounted Brigade: said that he was rather a believer in protective cavalry being used to a certain extent for the duties of exploration, backed up by bicyclists or mobile infantry. As far as his own experience went of soldiering in Great Britain, from the point of view of manœuvres and other training he thought that the working of cavalry in this way (*i.e.*, of the cavalry

working with infantry or bicyclists), had been very little experimented with, and he thought many of them would like to see training of this description carried out when opportunity offered.

He thought cavalry officers would be greatly interested to hear the Lecturer's able summary of the principles advocated by the two schools of thought as to the employment of cavalry, and whether they agreed with the one or the other method advocated, they had at any rate been given plenty of material to think about and weigh over in their minds.

THE NEED OF MORE CAVALRY.

Personally he quite agreed with General Leach, that reading between the lines, one could see that General de Lisle had his own convictions on the matter, which were, that many opportunities would occur (especially in cases where the cavalry on the one side were weaker than on the other), where the combination of the two arms would, in the end, turn out to great advantage. As regards cavalry on the field of battle, he thought the whole point was that they had not sufficient cavalry. If they were to use cavalry from the strategical point of view, and from the protective point of view, and if they also wanted them on the field of battle, it was clear that they must have more cavalry, because, after the severe work of exploration, it was hardly to be expected that they would have a body of fresh cavalry in hand, with their horses fresh and ready to take part in the final episodes of the battle—which appeared to him one of their most important rôles, because cavalry, being mounted, could be transported rapidly from one point of the field to the other. With a great extent of front, it was a great asset to a General, when the crisis came, to have a force in hand, which he could very rapidly throw into the battle wherever it was most needed; and cavalry was the only force which had the mobility necessary for this purpose.

Major-General Sir William Knox, K.C.B.: With regard to cavalry and cyclists operating together, I should like to say I had an opportunity of seeing that co-operation in the French manoeuvres, when the cyclists first came into vogue, and I cannot say I was impressed by it. The watchword of cavalry is *opportunity*. What happened on this particular occasion in the manoeuvres was that the French Commander on one side, who had a battalion of cyclists, lost his opportunity. He had a splendid tactical position for inflicting a defeat by shock action upon the enemy, but he waited for his cyclists and he lost both his opportunity and his fight. I need hardly say, of course, that officers who are at present serving cannot criticise our present arrangements of cavalry organization, but I am bound to say that much as we like to talk about strategical cavalry, tactical cavalry, and that sort of thing, where we shall be hampered will be with reserve men coming into our ranks on strange horses. One awful handicap our cavalry leaders will have in war will be that they will meet an opposing cavalry that is maintained in peace at war strength, and that, of course, is a tremendous factor. We shall hardly have time when we are rushing or galloping into war to get our reserve horses or our men into condition, as they were able to do in the old days. For instance, mechanical science now conveys us to the strategical points by rail, or otherwise, and we are launched straight into the manoeuvre area, and must be ready to work immediately with our full strength. In the old days the line of march was long, and gave an opportunity for leaders and led to get themselves into condition and the men to become

familiar with their horses. In those long stretches of march a certain number of men did drop out, of course—it will astonish some of you when I tell you that Napoleon a hundred years ago lost more men going into Russia than he did coming out, entirely from the length of the march, though, of course, he marched ahead of his supplies. Nowadays, unless you have a cavalry so organized that the men are all of equal calibre you are bound to suffer very materially when first meeting the enemy.

In my study of the failures of cavalry to do in war what might be expected of them, it has been more often than not the fault of the Army Commander, who had not realized the power and possibilities of the weapon he had in his hand. A notable instance of this is that of the Third German Army in 1870. MacMahon shattered his cavalry by using them over ground totally unsuited to shock action, intersected with vineyards and enclosures. The Crown Prince, with a splendid force of cavalry, won a decisive fight, but for 11 days he lost complete touch of the line of his enemy's retreat.

The Lecturer, in reply, said: Two of the officers who have taken part in the discussion have expressed a desire that I should define my own views on the subject of my lecture. I must say first of all that I purposely abstained from doing so. I had no intention of expressing my own views, my idea being rather to put forward those of the various French writers who have given this subject deep thought and study; and of asking for an expression of the views of those who have been good enough to come to the lecture. But in face of the challenge I must say that I have very decided opinions on the future possibilities of cavalry, and very decided opinions on reconnaissance; and although I would hesitate to employ the weaker cavalry force, acting without support, I would do so provided I had confidence in its leader and subordinate officers. In cavalry, which, as Sir William Knox has just said, is an arm of opportunity, everything depends on leaders. Wherever cavalry leaders will go, their men will follow. That has been taught us by history. Therefore, although I think the Commander-in-Chief should hesitate to employ the weaker cavalry without support, I do not think he should ever be condemned for risking cavalry, for risk is the life of this soldier. I am inclined to favour very much Napoleon's systems of supporting cavalry, and of supporting it *strongly*. We find him using two corps, or 30,000 men to support a reconnaissance. The fatigue to the infantry corps is not excessive, and their presence alone gives tremendous confidence to the cavalry, and enables it to do what otherwise would be impossible. I think, therefore, in reconnaissance, when possible, the weaker reconnoitring cavalry should be supported, not by weak detachments but by a strong force of infantry. I do not here go into the question of who is to command this strategical advanced guard, although I favour Napoleon's system of placing the whole under his cavalry commander. As regards cavalry in battle, I am the strongest believer in keeping cavalry in reserve. I have a strong faith in the ability of cavalry to achieve extraordinary results in spite of the accuracy of modern weapons. As I said in my lecture, so much depends upon the youth and personality of the leaders. Whether you have cavalry reconnaissance or whether you have cavalry in battle, the success of your cavalry will depend on the personality of the leaders.

The Chairman: After all, I do not think anybody can say they have had no personal opinion from General de Lisle. He has given us the faith that is in him, and the reasons for it, and for my own part I must

say he is very convincing, and I am inclined to go the whole way with him. The lecture has been a very valuable one, and there are a great many points in it that will bear thinking over, and re-reading and re-thinking over. While listening to the paper, I underlined two or three points. One of the most important is on the second page,¹ "*Before committing his force to any definite plan, the Commander-in-Chief will require reliable information.*" That has been criticised by Sir Philip Chetwode, but I do not think that General de Lisle meant by that that the Commander was going to wait to see what the other fellow did before he made his plan. It meant that before committing his force to his own definite plan, before sending his force out, he must get certain information. Then on the third page,² the reasons for using steel in preference to the fire weapon are mentioned: "*To endeavour to overwhelm an enemy's cavalry by means of fire action only would take far too long.*" There is no doubt that the rifle and the gun are all powerful, but nothing can be decided by fire action in the space of time in which it can be decided by steel, if opportunity arises for the use of steel; though the fire action will often help you to the use of steel, when, as he says, quick and decisive victory is wanted. There is another point on the sixth page of the lecture.³ One of the most important of all rules for the employment of cavalry is Napoleon's method: "*Not once did he send all his cavalry reserve on a vague mission of exploration. He sent only as much as was necessary to a defined place, and specified exactly what he wanted the cavalry to do.*" Telling the cavalry exactly what their task is to be is a matter very often neglected, and it is due, as a rule, to indefinite thought on the part of the General who sends them out—the supreme Commander. He has not quite made up his own mind what he wants to know, and he sends his cavalry out on a vague mission, to clear up the situation. Napoleon knew exactly what he wanted, and sent his cavalry to find out exactly that which he wanted to know, and never on any vague enterprise. With regard to the question of support to cavalry, I am entirely in agreement with what is said in the paper about the support of cavalry by infantry when necessary, in a strong strategical advance guard. All great commanders who have used their cavalry successfully have supported them by infantry and fire action.

CAVALRY IN THE FIRING LINE.

Another question is whether cavalry should assist the infantry in the firing line of battle. On occasion they may. It has often been done successfully and usefully, but as a rule it is an extravagant way of using cavalry, as the Lecturer has pointed out. It is very difficult to extract cavalry from the fire fight when they once get into it, and to have them available for pursuit or the final crisis, in which the cavalry is of such great importance. Even a whole division of cavalry thrown into the firing line does not provide any large number of rifles; the number of rifles in proportion to the infantry is so small that it is an extravagant way of employing cavalry unless for the purpose of deception. You may want to use cavalry to deceive the enemy, and to make believe that infantry are making the attack, but I do not think any enemy would be very much impressed by knowing they were attacked by dismounted cavalry. I am talking of the action in battle of large bodies of troops. I do not think that, as a rule, the battle would be very much helped by your throwing

¹ JOURNAL, page 788. ² page 789. ³ page 792.

cavalry into the firing line. The number of rifles would not be sufficient to make up for the loss of the mounted action that would be required later on. As the Lecturer said, "*The idea of using the cavalry reserve to strengthen any weak part of the firing line is no doubt very attractive, as its mobility enables it to move to any weak position in so short a time,*" but we must remember that, once committed to the firing line, cavalry cannot be used for any other purpose. I believe with the Lecturer that the great use of cavalry in battle will be to intervene in the great finishing fight.

MORAL FEARLESSNESS.

The Lecturer has replied to the few criticisms that were made, but I should like to support him and emphasize with all my power his last remarks, that the efficiency of cavalry depends on its leaders. With good leaders even inferior cavalry can achieve great things, and these leaders must be young and fearless; and when he says "fearless," I take it he lays great stress on moral fearlessness. Most men are physically brave; but moral bravery especially in a battle is a much less common thing. Moral courage that can see great losses inflicted and that can run great risk, not personal risk of his own life, for that is nothing, but of the force under his command—to see that force melted away and destroyed, and to consider that as nothing, so long as the main object is gained and the victory is assured—that is a form of courage which is very rare, and it is a form of courage that deteriorates as one gets older. Therefore leaders should be young. In great wars the leaders are young. One finds in nearly all cases that the young leaders come to the front in a few months of war, but it is at the beginning of war nowadays that we want to be at our best. Wars that make and unmake nations are not the uncivilized wars to which we are used. We shall fight against men belonging to a nation of trained warriors, and if we are not at our best in the beginning there will be no coming all right at the end. We shall never get a chance of that. One could talk on this subject all day long, as the Lecturer has given us so much to think about, but I will simply ask you to join me in a vote of thanks to the Lecturer for his useful, eloquent, and learned lecture.



THE SUPPLY OF HORSES FOR THE TERRITORIAL FORCE.

By COLONEL H. H. MULLINER, R.F.A. (T.F.).

On Wednesday, March 13th, 1912.

The Right Hon. Colonel J. E. B. SEELEY, D.S.O., M.P.,
Under Secretary of State for War, in the Chair.

THE CHAIRMAN: My Lord and gentlemen, we are assembled here to-day to discuss a very important matter in connection with our military forces. It is very vital for us to be ready for war, and it is often forgotten, I think, how necessary it is for us, with our wide Empire and our varied responsibilities, to have our regular forces ready for war in the shortest possible period. As everyone here knows, in making ready for war the horse difficulty is one of the greatest, if not the greatest. It is true, no doubt, that the particular aspect of the problem we are discussing to-day, the supply of horses for the Territorial Force is, owing to our insular position, probably not quite so urgent as in the case of the Regular Forces for operations overseas, but nevertheless, it is vital that the horse problem should be faced, and it is patent to everyone that the advance in mechanical transport makes the problem more and more difficult as the years go on. We have here to-day in Colonel Mulliner a man peculiarly well qualified to speak on the subject. Quite apart from his military qualifications, which are known to you all, he has made a special study of the horse question, not only in this country, but in other countries, and notably in Austria. In calling upon him to speak I know you will give him a good hearing, for in addition to the enquiries he has made in other countries, he has set on foot in the county of Warwickshire, in which county he is a prominent member of the Association, a scheme which, if it can be made to work universally throughout the country, seems to give a good prospect of solving our difficulties, at any rate for some time to come. I am sure we are grateful to you, Colonel Mulliner, for coming to address the meeting, and I now have great pleasure in calling upon you.

THE LECTURER: It seems necessary to make a few preliminary remarks, but I will cut them as short as possible as I presume every one in this room is familiar with the present difficulties of horsing the Territorials.

cavalry into the firing line. The number of rifles would not be sufficient to make up for the loss of the mounted action that would be required later on. As the Lecturer said, "*The idea of using the cavalry reserve to strengthen any weak part of the firing line is no doubt very attractive, as its mobility enables it to move to any weak position in so short a time,*" but we must remember that, once committed to the firing line, cavalry cannot be used for any other purpose. I believe with the Lecturer that the great use of cavalry in battle will be to intervene in the great finishing fight.

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THE LECTURER: It seems necessary to make a few preliminary remarks, but I will cut them as short as possible as I presume every one in this room is familiar with the present difficulties of horsing the Territorials.

When the Territorial Force was instituted, military requirements for horses largely increased on account of the many new Artillery and Engineering units, the addition of which was the principal feature of the new scheme. These units all wanted horses for immediate use and provision making in the event of mobilization.

The Yeomanry demands remained as before. In many country districts the men themselves still own a proportion of the horses they bring to camp, and the £5 grant is sufficient to enable some of those who do not own horses to borrow them from their relations and friends. But Yeomen in London and many districts do not own horses and individually are not in the way of borrowing, so their position is the same as the new artillery and engineers, their c.o.'s having to place contracts for hiring.

The Honourable Artillery Company of course existed but they were able to hire from the large London jobmasters, and the horses they borrowed were used, as regards military purposes, only by them.

The same method—the hiring system—was suggested for the newly-formed Artillery and Engineers, both for their camps and for drills, parades, etc.

OBJECTIONS TO THE PRESENT HIRING SYSTEM.

Two difficulties, however, presented themselves:—

- (1) *The new units were established chiefly in country towns where often no supply of horses for hire existed.*
- (2) *And—which is of far greater importance—the number of horses which might have been available, such as were used for omnibus, pleasure brakes, etc., rapidly diminished owing to motor traction*

The London 'bus horse—ideal for Artillery and Engineers in case of mobilization—has now almost disappeared.

The amount paid for hire at Territorial camps is so large that a new class of Government contractor has developed specially. There would be no objection to this if the £5 paid promoted keeping *good* horses in the country, but instead they are first loaned to one unit and then to another, the same horse earning the £5 grant four and even six times in one year. Dates for going to camp have to be arranged to suit, in case other units are using the only horses available. Naturally, the class of horse supplied is the cheapest and worst, bought specially at the beginning and sold at the end of the hiring season; numerous difficulties also arise owing to the impossibility of properly inspecting and rejecting the horses before the brigade meets them at camp.

In other words, even if hiring was practicable three or four years ago, to-day it has proved impracticable, at all events in most districts, but I think everyone who has had experience

will agree that the present arrangements for horses at camp are most unsatisfactory and should be changed at once.

Territorial Artillery and Engineers are recruited from a class not accustomed to riding and they have to be taught and to practice regularly, the greatest difficulty also exists in arranging for the horses for this purpose.

Failing hiring, how are the horses to be obtained?

The only alternative to hiring horses seems to be purchasing. Horses are only wanted for camps and on three or four evenings a week and on Saturday afternoons during about half the year. What could be done with purchased horses meantime? They continue to eat, and the expense of keeping a horse per annum is almost as much as its cost.

In a few instances where the Brigade is a large one it might be practicable to purchase and keep a small number of horses just for teaching the men to ride. Nine horses are about the minimum for a riding class.

The capital required to buy even nine horses at £42 each is £378. I leave out any question of obtaining them by private munificence or allocating other grants, as neither of these sources can be relied upon; so the amount must be borrowed, and unless the unit possesses stables (which only happens in a few districts where old barracks have been taken over), new stables would have to be built.

Keeping nine horses (including grooming) at 14/6 a week amounts to £340 per annum. Allowing for replacements, repayment of capital, veterinary attendance, etc., brings the figure up to over £400 per annum.

Deduct the camp grant of £5 for each horse; this leaves £355 to come out of the annual Riding Grants.

Such a scheme may be feasible in districts where four or five batteries are grouped together using the same horses; and it might prove some advantage in certain manufacturing towns where a few men are sometimes engaged on night work and are wanted to learn to ride during the day. But the nine horses would spend their lives going round and round the ring and would become very stale; the riding grants would be used up and—except for nine horses—the Brigade would still be entirely dependent on hiring for parades, drills and camp.

The horses might be sold at the end of the training season, or they might be hired out during the winter months, but both plans seem too speculative.

Except in very special cases, any scheme of "Keeping" horses seems impracticable for Territorials.

A better method appears to be a modification of the Austrian plan, where the Government buy the horses and then lend them, without charge, to tradesmen, farmers and others, retaining the right to use the horse at certain specified times and to take it back altogether in the event of mobilization.

**ALTERNATIVE PROPOSAL: PURCHASE BY WAR OFFICE
LOANS.**

Surely (unless the cost is prohibitive) it would be better finance to own and board out the horses instead of paying away vast sums every year for hire; hiring leaves no asset and neither encourages breeding nor retains *good* horses in the country.

There is no experiment in what I suggest, it is already adopted by several cavalry regiments, it has existed for the Austro-Hungarian Territorial Force for many years; it works very satisfactorily in that country. The Austro-Hungarian is perhaps the best horsed army which exists.

I would add that we have tried the scheme in Warwickshire, and I have no hesitation in saying that it has proved an unqualified success both in the City of Birmingham and in the comparatively small town of Rugby.

Like most schemes, this one commences with the necessity for capital. The War Office might advance the capital on loan as they would have good security for repayment, and more, when the loan was repaid in 12 years they would still possess the total number of horses—not the horses originally purchased, but others bought for replacements during the period. In other words, their capital would be repaid twice over, as they would have their money back and would also have the horses.

And—I emphasize this—it would not cost the War Office one penny more than is now spent on hiring.

My own belief is that at the end of the term the War Office would own even more horses than the original number; but that hinges entirely on the longevity of the horses. I allow for replacing one horse out of six each year; many of you gentlemen present are better judges than I am as to whether the working life of a horse under boarding out conditions would average more than six years.

The average age of the horses in our regular army is over ten years, many are far older.

In Austria the borrower owns the horse at the end of six years, considerable value is attached to this concession, proving that the average working life there exceeds six years.

As to the cost of the horse—I assume £42, or rather £41 13s. 4d.; whether this is a sufficient average or otherwise for suitable five or six year old horses is a matter of opinion. I have taken many opinions. My figure is on the assumption that skilled buyers would be appointed and that horses would be purchased in considerable numbers.

I am sure the question will be raised as to where it is proposed to buy the horses, and suggestions will be made about breeding.

The horses should be bought wherever they can be bought best. Essentially this scheme has nothing whatever to do with breeding horses. In my opinion, the supply of horses for the British Army has suffered more by discussions about breeding than from any other cause. Directly the subject of shortage

of army horses crops up, criticism is ended by devoting some sum to the encouragement of breeding.

Whether or not it is a real kindness to a British farmer to encourage him to breed horses is doubtful. It may answer in certain districts, but whether it would help army supply is another question.

Possibly more practical results might ensue if breeding for army requirements was encouraged in our Colonies, especially in some of the Canadian provinces, such as Alberta.

Taking £41 13s. 4d. as the price of the horse, the War Office might lend that sum to the various Associations multiplied by the number of horses requisite.

I suggest as the basis of a loan £500 for each £75 now paid annually for Riding Grants.

This would work out as follows:—

£500 would purchase (at £41 13s. 4d. each) 12 horses.
The annual expenditure would be:—

Replacement $\frac{1}{6}$, i.e., two horses out of 12	
each year	£83 6 8
Management and Veterinary inspection at	
17/6 per horse	10 10 0
Repayment of the loan $\frac{1}{12}$ of £500 ...	41 13 4

A total expenditure of £135 10 0

Equal to about £11 per horse per annum.

As regards revenue—for 12 horses the Associations would relinquish out of their present Riding Grant ... £75 0 0

Also the £5 camp grants they receive for
12 horses 60 0 0

Total £135 0 0

which within a few shillings, is the same as the annual expenditure.

The War Office would have good security—they would have the best of security, their own, as they could retain the sums they now pay.

No credit is taken for any amounts receivable by sale of cast horses; these might form a fund to meet small expenses which must occur.

I include no amount for insurance as I claim this is covered by replacing each year one out of six.

In Rugby we have had 24 horses for a year, none have died; I am sorry I cannot say that every one is sound. I hear that one horse is lame but it is hoped will soon recover. However, we have not had to replace any of the four we allowed for. All the same we are going to buy four more horses, increasing our number to 28, so even if eight are disabled at the end of next year, we shall be still within our estimate.

The next question is—Who is to keep the horses? Lend them to any responsible persons to use and treat reasonably just the same as if they owned them. In return the borrower must send the horse to the local barracks one evening in each week during certain months, most Saturday afternoons during the same period and for the 18 days at camp.

AGREEMENTS WITH BORROWERS.

The Agreement is not for a particular horse, if the first one dies or is disabled from any cause except wilful negligence, he would receive another. The Borrower has no capital outlay either for purchasing in the first instance or replacements; he can work the horse during the day and we have it in the evening, and he can work it on Saturday mornings. All we stipulate is that he will not work it unduly.

Major West and Lieutenant Nickalls are present, they have managed the scheme in Rugby, and I would here like to say that any future developments will be largely owing to their having proved its practicability. I think they will tell you that in no case has there been any friction about the horse being over-worked. In the summer, during our camp time, it often happens that it is a convenience to the borrower to get rid of the horse as it is the slack period, people are at the seaside, etc.

With our 24 horses, we have had eight horses at the Riding School three evenings a week, and the whole 24 for Saturday afternoon drills.

Twenty-four horses are not really enough, we cannot take out the four guns and the four wagons; we cannot train the men sufficiently. We ought to have 40 horses—that would give four for each of the guns and four for each of the wagons, and leave eight over for non-commissioned officers, assuming, as is often the case, that officers provide their own.

Our Riding Grants (on the basis I have mentioned) are insufficient to provide 40, but in the hope of getting the scheme adopted I have based it on the absolute minimum. Then there is the point of view of the Borrower, the greater the number of horses, the less frequent the demands on him; it enables a little give and take, a little allowance if—as must happen occasionally—the horse is not fit.

I emphasize that the proposed scheme is of no practical use—it is doomed to failure from the first—if the number of horses allocated to the various Units is too few.

Many people who are in sympathy with the Territorials, regard Territorial Artillery as impracticable. I agree with them, but only if no proper provision is made for horses. The class of men who join Territorial Artillery and Engineers are skilled artisans, who soon become remarkably efficient in the mechanical work; horses are the difficulty—once give them a nucleus of trained horses and there will be no fault to find with their general efficiency.

Camp lasts a fortnight, some men are only able to stay one week; now it takes more than a week to get used to the hired horses which are seen then for the first time; to find out which are jibbers, which are possible as wheelers, which for leaders, and which (a considerable number) are no use anywhere. In other words, the greater part of the camp period is now wasted trying horses. With a nucleus of "owned" horses the position is entirely changed; I speak from the experience of the last year's training when the Rugby Battery had a nucleus of their own and the Coventry Battery were dependent on hirelings. Colonel Lister's experience was that his own horses were so immeasurably better than the hirelings that everyone wanted them.

Of one thing I am absolutely certain—when the scheme is known there need be no difficulty whatever in obtaining borrowers. I admit at first we had difficulty, but directly the scheme was understood, local users of horses realized the commercial advantage to themselves. To-day we have at Rugby a long waiting list of borrowers, and at Birmingham (where they also have 24 horses) they could easily place a further 50. In Austria-Hungary the demand is far greater than the supply.

THE OBJECTIONS TO INSURANCE.

The only point in our Agreement which the borrowers object to is the Insurance Clause which we had to insert to meet War Office requirements. The scheme will not be really popular until this is abandoned. The insurance which the War Office ask for is against death by misadventure—not against total or partial disablement. Death by accident and disease is not a serious risk and in my opinion is amply covered by the provision for replacing one horse out of six in each year.

Any large user of horses present will perhaps tell us if in his experience the total risk is more or less, or whether he insures.

Insuring horses is a very unsatisfactory matter. A horse can tell no tales of how the accident occurred. A real policy of insurance, namely, against sickness and accidents, would cost a large amount.

I cannot see the object of encouraging small Horse Insurance Companies and contributing to their management and office expenses. The risk is spread over a large number of horses—why cannot County Associations take this slight risk themselves?

At Rugby we were compelled to insist on the borrowers paying insurance; we gave each the option of taking out their own insurance, or paying 30s. per annum to the Association for that purpose. They all paid in the 30s., and as we have not lost a single horse, we are this year £36 to the good, but I do not think it was worth the friction and trouble.

In Austria-Hungary no insurance is demanded.

It will pay much better to have as few restrictions as possible. It should not be a question of obtaining borrowers, there should be a competition to get the horses. Only under such conditions can you pick and choose the best borrowers and afford to take horses away directly they are not being looked after satisfactorily.

The total annual drill and riding grant for the Territorials is about £44,000. On the basis of £500 for every £75 of such grant, the total loan for this preliminary scheme would be £294,000, which would provide 7,006 horses. £294,000 is a large sum, but I point out that it is not an expenditure, it is a loan, repayable by annual instalments. In return for this loan the War Office will always own 7,000 horses which are not costing them one penny to keep. I emphasize this because one is apt to forget that every horse costs over £30 a year to keep.

Under ordinary circumstances 7,000 horses cost at least £210,000 per annum to keep.

So far I have only provided for drills and a nucleus at camp. Large numbers are still wanted to make up the full establishment, in other words the total number wanted at camp.

EXTENSION OF THE PRINCIPLE.

The same principle can be extended but the difficulty is finance. Associations hesitate to recommend increased expenditure, perhaps they feel it is useless. All the Riding Grants have been allocated and only the £5 camp grants remain.

On the other hand, we have provided for all our requirements as regards riding.

In the previous or local scheme the borrower had to send in the horse on certain evenings and on Saturdays; this limits the area for borrowers to the neighbourhood of the barracks. Of course, there are infinitely more borrowers outside this area than within it.

Instead of sending in the horse on these evenings and on Saturdays, the second class of borrowers must give up the horse for a month or five weeks instead of 18 days, then the horse could serve two consecutive camps and earn £10.

There would be no difficulty in soon obtaining a further 7,000 borrowers in this country. The terms I suggest for the second scheme, only giving up the horse for five weeks, should be attractive to the borrower; they are practically the same as in Austria.

I regret that in this extended scheme, on the basis of my previous figures, the horses would cost the War Office £1 per annum each; this is because we now only get £10, whereas by allocating the Riding Grants we obtained about £11.

As a set-off against this, I point out that when the loan is repaid, the £3 6s. od. we provide for repayment of capital would cease; then the War Office would be making a saving over their present expenditure, in other words a profit of £3 6s. od. per

horse for each of the 7,000 in the preliminary or local scheme and £2 6s. od. for each of the 7,000 horses in the extended scheme. A total profit of £39,200 per annum.

The annual amount now allocated for hiring at Territorial camps is £250,000, *i.e.*, 50,000 horses at £5 each. Take away the 7,000 horses provided in the local scheme, and 43,000 horses remain. It is reasonable to assume that a further 7,000 might serve two consecutive camps, still leaving 29,000 horses to be found.

To sum up, for the two schemes, the War Office is asked to advance £588,000 on a twelve years' loan, repayable by twelve equal instalments. In return (entirely out of their existing grants) the County Associations will provide and keep for the W.O. 14,000 trained and suitable horses.

I would like to add that in my opinion the County Associations would not only be capable of undertaking this work, but would do it thoroughly and well.

At the end of twelve years the Government will still possess at least 14,000 trained horses and will be saving £39,200 per annum.

Presumably, in case of war, these 14,000 horses, or the greater part of them, would be at once taken over by the Regulars. No one would object to that. The value to our Regular Army of such a reserve cannot be over-estimated, especially considering their present shortage, even on a peace basis.

To realize what an extra 14,000 trained army horses really means, I point out that the total number now owned by our Regular Army in Great Britain is only about 23,000.

The recent census will show that a large number of horses exist in the country, but how many would be suitable and immediately available in case of mobilization is another and a very serious matter. Would there be enough suitable horses for the Territorials and the Reserve when the Regulars had gone and taken with them the 14,000 horses, to say nothing of the enormous wastage in war, etc.?

It must also be remembered that the numbers in this country are diminishing, not increasing.

THE NEED FOR IMMEDIATE ACTION.

I make one appeal, namely, that this scheme—or I hope a better one—should be settled at once. The plan I have advocated was fully discussed and adopted by my County Association three years ago and then recommended to the War Office. Since then it has been tried and proved a success. This year, apparently, large amounts are to be again wasted on hiring unsatisfactory horses; whereas much could be done even this year if the matter was now decided at once.

I venture to claim that the Territorials deserve immediate consideration of this horse question; their position is an

anomaly. When they were called into existence, a necessity of such existence was 50,000 horses; has enough been done to provide this necessity?

I point out that the loan would not be all wanted immediately; it would have to be spread over two, or perhaps three years. The horses could not be purchased at a day's notice; C.O.'s would not be able to send in to their Associations applications from approved borrowers without some delay.

As regards purchasing the horses—if this scheme is taken up it must be taken up thoroughly. The aim is to acquire good horses suitable for military purposes; from first to last the horses would remain the property of the War Office and it is the business of the War Office to see that only proper horses are purchased.

The class of horse bought for the Regular Army is excellent. The Remount Department have a great reputation both for buying cheaply and for buying well. This Department should be extended so as to enable it to buy the Territorial horses. The County Associations would, I am sure, give their assistance in working the scheme, but buying horses is not their *metier*, it is a profession by itself.

The requirements for the Territorials are different from those of the Regular Army; for the Regular Army raw horses are bought and sent to regiments to be conditioned and trained. Neither Territorials nor County Associations have stabling or facilities for this purpose; the borrowers want their horses reasonably fit and ready for use, and again they must be able to call for immediate delivery of other horses in case of necessity.

The whole difficulty could be overcome by establishing on Salisbury Plain a farm, with stabling, where the horses could be sent and where they could undergo a small amount of breaking and conditioning ready for use. To work the scheme a surplus of horses must be available, but these surplus horses might be earning some of the £5 camp grants. There is still £348,000 per annum which would be available.

A succession of camps takes place on Salisbury each year, so that no railway expenses would be incurred.

DISCUSSION.

Capt. F. Colchester Wemyss (Secretary Gloucester Territorial Force Association) said he took great interest in this subject because Gloucestershire had for some time adopted the scheme which had been dealt with by Col. Mulliner. They realized long ago that it was quite impossible to have efficiency by hiring horses in the ordinary way, and that the only thing to do was to adopt some sort of scheme of purchase. They had 30 horses for their engineers and 12 for one battery of artillery. They had two other batteries and an ammunition column, and they wanted 36 more for those, but owing to difficulties with the War Office, they had not got those horses, though they hoped they very soon might.

THE SCHEME ADOPTED IN GLOUCESTERSHIRE.

The system they adopted was very much on the plan already described by the Lecturer. They borrowed money from the War Office, which was to be repaid in ten years. At the end of eight years all their horses would have been replaced; at the end of ten years all the money would have been repaid; and from that time forward they would not have to make any payments for repayment, so that so far as finance goes, they would be on velvet. All the money that had been put aside for repayment would be available to spend in other ways, either on other horses or for other purposes.

The horses they had bought were all six-year olds, with a few exceptions. They had one or two seven-year olds and two or three five-years olds, and they paid about £37 apiece for them. They bought them on rather favourable terms perhaps because they worked them in with another scheme. He had assisted in buying a certain number of horses for the Board of Agriculture, and they worked in the two together, and bought the horses rather cheaper through buying a quantity. They paid a veterinary surgeon's fee of £1 per horse per year, and nothing in the way of insurance, as they took the Lecturer's view that it was covered by the replacements. There was one difficulty about the scheme which he thought would occur to most people when they tried it, viz. : that every unit that wanted to have horses for itself must have some special officer who would take close interest in the scheme; who would find custodians and see the horses constantly for the purpose of ascertaining that they were being properly looked after; it was not every unit that had a man of that sort; and where one had not such a man one should not embark on the scheme. There was further a certain risk in connection with the scheme which they had never attempted to conceal in their negotiations with the War Office, but it was a risk which had to be faced, namely, that at some time in the future custodians might not be forthcoming. He did not think that would ever be unless motor traction took the place of horses to a very much greater extent than at present, but if that did happen, the custodian would inevitably fail. But this risk need scarcely be taken into consideration, because, supposing that time did come and motor traction superseded horse-flesh, it was evident they should not be able to hire horses at all, and then they would be compelled to buy them, and actually keep them, instead of putting them out with custodians.

HORSES ON MOBILIZATION.

The Lecturer had not touched on another very important point : the supply of horses on mobilization. There was a scheme in operation for registering and purchasing these horses, which the Chairman evidently thought very well of, from a statement he made in the House of Commons on the previous night. He hoped that the Department which Colonel Seely administered would realize that there were two opinions about the scheme, and that if they came to a conclusion during this year that, owing either to the officers who carried out the registration not being selected on account of their knowledge of horses or for any other reason—if they came to a conclusion that the existing scheme was not all they thought it to be, he hoped they would not hesitate to drop it and embark upon another one in conjunction with the Territorial Associations. A scheme had been outlined in Circular Memo. 231 some time ago, which many Associations thought was a very practical one,

and he thought it only broke down on the score of expense. One outcome of that scheme was that they had a most valuable census of horses made by the police, and that census showed there were plenty of horses in the country. Everyone had been surprised when they found out how many horses there were. In Gloucestershire they found they had 30,000 horses, and, working that out according to the proportion of population, there were probably something like 900,000 or a million horses at least in the country.

DEFICIENCY OF ARTILLERY HORSES.

As far as concerned riding horses, he thought that as long as they had hunting in the country there would be no difficulty about them. As regards heavy horses, there would be no shortage; but as regards horses for artillery purposes, the horse that might be called the busser—that horse was scarce now and must inevitably become scarcer, and it was necessary to do something to make up that deficiency. Something was being done to encourage breeding, though he feared not directed to this particular necessity. A considerable sum of money was being given from the Development Fund, £40,000 a year, and this was being distributed by Committees all over the country under the supervision of the Board of Agriculture. But he was sure that nothing would make farmers breed horses unless it paid them to breed them.

Capt. E. U. Bradbridge (Secretary Ayrshire Territorial Force Association) said that his Association wished him to detail a scheme that they had in Ayrshire, which was very much on the lines that Col. Mulliner had described. In Ayrshire they had a regiment of yeomanry, a battery of horse artillery, two batteries of field artillery and an ammunition column. With reference to the horses for the annual training, when the classification of horses in the county was taken out of their hands he suggested to the War Office that they should add a column to the classification sheet showing the names of owners willing to lend their horses for the training. The War Office returned this, but the Scottish Command took it up, and he saw that in the latest print this column had been added. The result for Ayrshire was now in his hands, and showed that there were enough horses in the hands of private owners in Ayrshire to horse their field artillery; and they proposed this year to obtain the horses they required from private owners in the county.

It was rather difficult to arrange the procedure for the collection and entraining of the horses, but his Association hoped that the Commander-in-Chief in Scotland would permit the machinery he had set up for mobilization to be used for this purpose.

The Chairman: Can you tell the meeting at what price you propose to obtain them from private owners?

Capt. Bradbridge said it was £4. They had to insure them, which cost 6s. a horse, making the cost £4 6s. od. altogether. They hoped to use a number of these horses for drills to supplement their own permanent horses. The ultimate object was that the horses of private owners in the county should be trained and available for units on mobilization. With regard to their system of maintaining a nucleus of permanent horses, in May, 1910, his Association bought 24 horses; in the Spring of 1911 they bought ten more, and last week a further ten, so that now they had 44 horses their own property. The average age of their horses was seven; they were saddled with a debt to the War Office of £1,380, but they

were not troubled on this score, because by their special scheme they could repay the debt over a period of ten years and also build up a sinking fund to replace horses. They were able to do this because, contrary to the Lecturer's advice, they hired out the horses to other Associations. His Association believed in this plan, because it enabled them to keep during the winter six horses at each of their riding schools. They had a battery and riding school in Ayr, another in Kilmarnock, and a third in Irvine, *i.e.*, in a triangle of sides each about ten miles long, with a riding school and six horses always at each place during the winter, the number of horses being increased for two months before the training to 24 at Ayr, 10 at Kilmarnock, and 10 at Irvine. They could concentrate all the horses on a Saturday afternoon or for a week-end camp. The Lecturer had said it was a bad system to rely on one horse to do five trainings. In his (the Lecturer's) own proposal he allowed them to do two trainings. Given that, under the present conditions by which horse contractors were employed, it was impossible to avoid each horse being used for more than one training, they thought it was better that their horses should have these extra trainings than that the contractors' horses, which were sold at the end of the training to go abroad, should do so. His Association for that reason suggested that they might deliberately allow the horses to be trained four or five times a year to enable them to hold riding school throughout the winter.

Major Williams Wynn (D.A. Director Remounts) said that under the G.O.C. the London District, he was responsible for finding about 8,200 horses for the Territorials on mobilization, and it did not seem to him that the Lecturer's scheme would help very much in his district. It would provide 496 horses. He had 24 batteries to supply as regards the artillery, and, of course, a proportionate number as regards the other arm. The title of the lecture was, he thought, too comprehensive. Instead of "The Supply of Horses for the Territorial Force," it should rather be "The Provision of a nucleus of trained horses for the Territorial Force," because it really only touched the fringe of the question. It would not meet the requirements in the way of horses for mobilization, which was after all the purpose for which the Territorials existed. However, there was a scheme for the provision of horses for the Territorial Force inaugurated by the War Department, Viscount Haldane and the Chairman, for putting in force the impressment clauses of the Army Act. He could only speak as regards London, and he had gone far enough into the question to satisfy himself that he could supply the horses needed perfectly well; only the method of collection remained a difficulty. He had been in consultation with certain staff officers of the Territorials, and he had no doubt they would eventually get some centralized scheme by which the horses could readily be procured on mobilization.

SHORTAGE OF RIDING HORSES IN LONDON.

As to the type of horse, London appeared, from the remarks of some of the speakers, to differ considerably from the country. They all spoke of a shortage of artillery horses, whereas he could horse his artillery with a very good class of horse—almost as good as they had in the regular artillery—but it was a very different matter to supply cavalry horses for the yeomanry, and he feared that a lot of the men would have to be mounted upon light draught horses. These horses all could be ridden and were ridden at exercise, but whether they formed particularly handy mounts was another question. It was supposed by some that every

horse ought to be trained for military service, but he thought that for a force like the Territorials—at any rate as regards the artillery, infantry and transport—a proportion between three-fifths and four-fifths would be perfectly satisfactory if the horses had been properly broken in to their ordinary duties in civil life. There remained a proportion for the artillery of something over one-fifth, which, in his opinion, required some preliminary military training, otherwise they seriously affected the efficiency of the battery and the brigade. As regards the Yeomanry, the proportion of trained horses required might be larger. He knew something about Yeomanry some years ago in his own county, but now he understood that they trained very much more on the lines of mounted rifles, and perhaps their horses would not require such a high standard of military training.

He welcomed Colonel Mulliner's scheme because it did provide a nucleus of trained horses, and he had no doubt that the finance was correct, as he gathered from the introduction to the Army Estimates this year that it had been approved, or some scheme of that sort had been approved, by the Secretary of State. But he could not quite follow the Lecturer in regard to his remarks about the full number of horses for training. The scheme provided 24 horses per battery as a minimum. They went out to train with 78 horses per battery, he believed, and after the riding grant and the other grant had been taken for advancing this scheme, he did not see where the money was to come from to make up the horses for the camp—the difference between the 24 and the 78—unless it was to be an additional charge upon the public. He gathered that the scheme would not entail any additional charge, but it was rather difficult to follow financial statements verbally, and therefore, perhaps, he was mistaken in that. Any scheme, however, which would provide a nucleus of trained horses, especially for the artillery, would be a great step in advance. If the system was at all generally accepted throughout the country he thought the War Office should lay it down that these horses should not be available for the Expeditionary Force on mobilization. If ever the Territorials required a nucleus of trained horses, they would require it more than ever on mobilization, when they were wanted to go out and do the real thing, and the Expeditionary Force must not be allowed easy access to those 7,000 horses. They would be the first horses the purchasers would take, probably, but if they did, they would at once deprive the Territorial batteries of their own poor little nucleus of trained horses. If the Expeditionary Force used those horses for their second line transport they might very well have been replaced by untrained civilian horses from other sources.

Mr. H. L. Baxendale said that he happened to be a large horse owner, and as one he looked with fear and trepidation on the position at the present time. He felt that the notion of there being plenty of horses in the country was a mistake. He knew that certain returns were being made, and in some of the counties with which he was connected these returns would be very short as regards the horses now available compared with the number twenty years ago. In an ordinary hunting country, old folk rode about on a horse 18 and 20 years old; they would all agree such horses would be perfectly valueless on actual service. As a horse owner the Lecturer's scheme certainly appealed to him if it could be carried out, but his fear was that they would not find sufficient people to take in the horses, because the annual wear and tear of a horse in pounds, shillings and pence was only a small item

in the cost of its keep. About £8 per annum would represent the value of a horse, whereas its keep would run into, say, at least £24 per annum. Again, the man who took in the horse was to give it up for 18 consecutive days at a particular period, and he did not think any trader could afford to do that. Again, the cost of sending him in once a week was a considerable item. Of course, one might get private individuals in the country to take in horses in this way, but as regards London, he thought they would fail almost entirely. He really trusted that some such scheme as the Lecturer's might be put into force, because as far as he could see the number of horses in this country was likely to decrease very rapidly indeed. They had seen the omnibus horse disappear practically in three years, and he did not see any reason why, if mechanical traction progressed at its present rate, the trade horse of London should not disappear nearly as fast.

Again, horse owners who were interested in their country looked with fear and trepidation on the effect that would be produced on the outbreak of war by seizing a large number of horses. He did not wish to regard it from a merely personal point of view, but it would cost him an immense amount of money, and personally he did not see the justice of it. Looking at it from the national point of view he felt it would produce lamentable results to seize a great number of horses at the moment war was declared. It would take away not only the means of moving goods or anything else from one part to another, but it would throw a very great number of people out of employment. A trade horse practically carried three people, so that for every trade horse taken two if not three people would be thrown out of employment at the outbreak of war.

Colonel H. C. C. D. Simpson, C.M.G., said that in his opinion, after an experience of three years in Wales as Divisional M.A., this scheme was unsatisfactory. He understood that the Custodians were dying away, and that the very greatest difficulty was often experienced in getting the present horses taken up.¹ With regard to the scheme of having on charge in peace a large number of horses which were to be delivered over to the Expeditionary Force in the event of mobilization, that seemed a most unsatisfactory scheme, from their point of view, however satisfactory it might be to the Expeditionary Force. It could hardly be expected that these horses which they had bought, certainly with Government money, but under the auspices of the Association, should be given over to the Expeditionary Force on the outbreak of war, when they would be wanted for the Territorial Force. The only solution they could see at present was in connection with the recent Registration scheme. The whole of his adjutants had selected the number of horses they required on mobilization for their brigades, together with a small percentage which they had to find for the Expeditionary Force. They had got into touch with the owners of those horses, and they were getting to know something about them; and what they hoped was that during peace they would be able to hire a small proportion of those horses during the non-training period, as well as during the annual camp. This would enable them to keep

¹ The keep of a horse is more expensive for a year than the initial cost of a tradesman's light van horse, and to have to surrender the horse for several evenings a week, and a fortnight during the summer does not appeal to him.—H.C.C.D.S.

in touch with the horses they were likely to have on mobilization, and they would be able to train them, so that those horses would form a nucleus in every team, and when they had to be used for mobilization purposes, the batteries would not be quite so hopeless so far as the horses were concerned as they were at the present moment.

Mr. H. Tilling said that he should like to say, to start with, that his firm were large contractors both for the Territorials and for the Regular Army. In the autumn of 1910 they were asked to supply, in conjunction with other firms, some 5,000 horses for the manœuvres, and they had great difficulty in getting the horses together. They had to go to Birmingham, Manchester, the West of England, and other large towns in order to get the sort of horse required, in a fit state. That, he thought, proved that the census taken was almost entirely misleading as to the sort of horse which was left in the country for the Army to use. There was another point which Colonel Mulliner had mentioned, and that was the fact that horses had been known to be used at five or six trainings in the course of a season. In his own experience that had not been so. They had let several hundreds of horses a year, and he thought he was right in saying that in no case had a horse ever been out more than twice, for the simple reason that the camps overlapped one another, and you could not let them more than twice. If it could be arranged that the camps should follow one another pretty consecutively, then it would be much easier for them, as horse contractors, to supply the horses, and they could do it at a less rate, but so long as they only got two camps in the year, £5 per camp per horse does not pay them. The artillery horse was the horse they found the greatest difficulty in getting hold of, but there was a large number of horses used in the country for hunting and riding which seemed to be always more or less available.

The Lecturer, in reply, said: There is but little I need say. The criticisms have been very fair. I was twitted by the officer from Ayrshire for complaining that hired horses were used several times at camp and then proposing to do the same myself; I only suggested "owned" horses earning two camp grants in order to make the scheme self-supporting. It was the quality of the horse now hired out for use at camps to which I so strongly objected.

I am afraid it cannot be put forward as a serious scheme, that Associations should make money by letting out horses to one another—as I gathered was suggested—though possibly co-operation between Associations might be advisable.

It is true that the scheme I have advocated only provides comparatively few horses. A better title for my paper would have been "The provision of a nucleus of horses for the Territorial Force." It attempts nothing more than providing the minimum number absolutely necessary. The balance would obviously have to be procured by such means as are being provided in connection with the census or registration of horses.

Mr. Baxendale raised a point that in case of war it would be sad if his and other large employers' horses were taken, as it would throw many men out of employment. I think that horses belonging to Messrs. Pickford are the very last which would be seized by the Government. Certainly not only their horses, but those belonging to railway companies and other large carriers would all be extremely busy in connection with transport in the event of an outbreak of war. This seems to me also

important as regards the new Registration scheme, as railway companies and carriers are by far the largest owners of horses. Certainly any man accustomed to looking after horses would, in the event of mobilization, have no difficulty in finding employment.

The Chairman: My Lord and gentlemen, it is now my pleasant duty to sum up the discussion, as is customary, though it is difficult to sum up a discussion in which such divergent views have been expressed; and especially to move a very hearty vote of thanks to our Lecturer of to-day, Colonel Mulliner. I think we may say that, as a result of this discussion, it is clear that while Colonel Mulliner's scheme could not, without very important extensions, both in the number of horses and in money, solve the problem of how to mobilize the Territorial Force, what he proposes would provide a nucleus which would at least provide the necessary horses for training men to learn to ride, and to some extent for purposes of drill. Now that would be a great advance; and it would have this added advantage, that if, as I understand is the case both in Ayr and in Gloucestershire, and also in Warwickshire, the class of horse obtained by the Association is a good class of horse, it is not only a nucleus, but an example, and it sets a standard which gentlemen like Mr. Tilling and Mr. Baxendale, who have been good enough to come here to-day, especially Mr. Tilling, will endeavour to attain. In other words, I think it would improve the standard of horse that is to be found in the Territorial Force.

With regard to what Mr. Baxendale said as to the taking of horses on mobilization, I can assure him, as I think everyone here knows, or anyone connected with the War Office knows, that the greatest care is now being taken, and will be taken in future, to see that no undue hardship is caused to owners when, on mobilization, horses are taken, and, of course, the full price will be paid for them. If anybody objects *in toto* to the principle of taking horses on mobilization, I would exhort him above all to stay in this country, and not to go abroad, because he would there find himself ten times worse off than he is here. It is impossible for any country to keep always in its own possession the whole number of horses required to mobilize the whole of its forces. That is inconceivable. Therefore the State must take them, and pay for them when the emergency arises. But that does not bear directly upon the question we are here discussing, which is the horsing of the Territorial Force in time of peace.

I would only say, in conclusion, that it has been a great privilege to me to meet at this meeting so many people who have a special knowledge of this subject, for it is one which must naturally weigh heavily on the mind of any one who is responsible, as I am now technically responsible, for the Territorial Force at the War Office. The result of to-day's lecture will, I think, bear good fruit. We have heard a definite scheme put forward, which I will ask Colonel Mulliner to send to me, if he will kindly do so, and I know that the Secretary will send a transcript of the speeches made by the gentlemen in the course of the discussion. We mean to go forward with a scheme. We do not think the position is satisfactory with regard to the Territorial Force, and I trust that possibly as a result of our meeting here to-day, a definite step forward may be taken towards further promoting the efficiency of the forces of the Crown.

It is now my duty, in conclusion, to move a hearty vote of thanks to Colonel Mulliner for his most interesting lecture.

APPENDIX.

Rear-Admiral R. G. O. Tupper, C.V.O., has forwarded the following remarks which he had intended to offer at the Discussion, had he been able to attend Col. Mulliner's Lecture.

The idea of the Government owning horses and lending them to various tradesmen, farmers and others who require traction, for the cost of their keep, so that they can be kept immediately ready and "fit" for their work if the Territorial Army is mobilized is, I suppose, the most economical way of meeting the difficulty, but daily one sees in all trades and professions the motor replacing horse traction. It, therefore, seems to me that in the first place the Government should give orders that all Government Departments requiring traction should use horsed vehicles, and thus keep a large number of the Territorial Army horses working for the Government. First there is the Post Office—it still possesses a large number of horsed vans and carts, but I see motor vans being introduced by degrees—it seems to me that in all cities and big towns and districts of, say, four miles radius and less, horses can and should be used, and as in such districts there are innumerable motors it would surely be easy to quickly substitute motors for horsed vehicles, or even to obtain a certain number of motors to tow the vans and carts usually horsed; these, indeed, might have special fittings, steering wheel, etc., handy to put on. Also in some country districts it might be possible to substitute horses for bicycles to carry telegraph boys. Nearly every Government Department requires vehicles of some sort; surely if these were compulsorily horsed throughout the United Kingdom, and motor substitutes provided for, on mobilization, large numbers of a useful class of horse would be kept fit and ready for immediate use. Then, in addition, arrangements could be similarly made by municipalities, to use horses instead of motors; I see fire brigades, and municipal and district councils substituting motors for horsed vehicles. Though no doubt economical, it seems a pity from the Army point of view, and if the above can be made to employ only horses and no motors another large number of horses can be kept "fit."

I see brewers are going in largely for motors; this seems a pity, as their horses were and are beautifully kept, and would be excellent for heavy artillery and heavy transport.



THE DEFENCE OF THE GERMAN COASTS.

(*Der Schutz der Deutschen Küste.*)

Translated from *Die Grenzboten*¹ No. 3, of 17th January, 1912,
and published by permission.

TO the series of foreign expressions for which there is no equivalent German word, belongs among many others the English word "scaremonger," a word to which every newspaper on that side of the Channel has opened its columns, since the bogey of German invasion began for some unknown reason to haunt the English mind. In political life we Germans do not know the word "scaremonger"; we lack it probably because we feel ourselves strong enough not to heed it, and consequently there is no necessity for the great mass of the people to coin a special word for the persons who scent danger to the Empire everywhere, even where it does not exist, and hawk it about.

The grave events of the last few months, with their rumours of surprise attacks and their espionage trials, have turned the brain of many a level-headed man.

Even events, such as are constantly occurring which, in quiet times, no one would consider of sufficient importance to engross attention for long, have been exaggerated, and have been marked as occurrences which might affect the welfare of the Empire.

The numerous espionage trials have justly excited public attention and vigilance. There have been Germans too, and amongst them even inhabitants of naval ports, who have declared that the defensive policy of the Imperial Government is on wrong lines and have spread an exaggerated fear of English espionage and apprehension that the enemy would be able to surprise our insufficiently defended coasts.

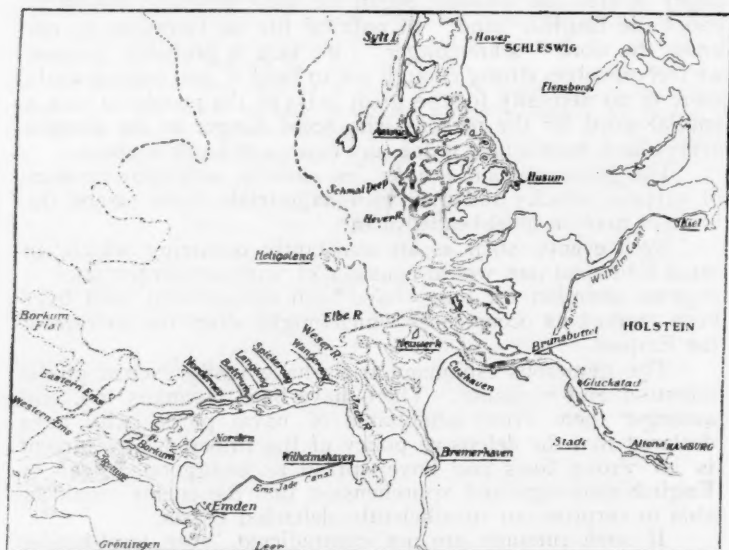
If such rumours are not contradicted, even level-headed people must take alarm. A country, which is conscious of its strength, has no need of "scaremongers." The strong man finds refreshing sleep behind wooden doors, while the weak man trembles behind iron gates. During the last few weeks excitement has run so high, that an explanation appears to be opportune. A brief glance at our coasts will show whether they are sufficiently defended.

THE BALTIC SEA.

The importance of the seas washing our coasts has often varied in history. For hundreds of years Sweden and Denmark,

¹ *Die Grenzboten* is a weekly Journal published in Berlin, and is known for its articles on political affairs.

and occasionally Russia too, have striven for the command of the Baltic Sea. Since the abolition of the Sound dues in 1857, the Baltic has been generally considered an open sea. In International law this state of affairs may, perhaps, not be disputed in the future. It may happen, however, that the continuous perfection of the means of guerilla warfare may cause the Baltic, considered from a purely naval point of view, gradually to acquire the character of a "mare clausum" to a people not dwelling on its shores. The difficulties of navigation of the Belts as well as the ease with which the Sound and the Belts can be obstructed by mines and guarded by torpedo-boats and submarines, give the Baltic Sea considerable protection from a western adversary. If, in spite of this, we have not



neglected to add to the old fortifications of Kiel modern defences which could successfully resist the attack of a strong fleet, this merely accords with the importance of Kiel as a dockyard and harbour. For the rest, the comparatively narrow entrance to Kiel Harbour, the narrow passages at Fehmarn and Adler-Grund to the east, and the Belts and Sound to the north, guarantee a sufficient measure of security to this rapidly rising naval port, which is of special consequence since it contains three large shipbuilding yards. The important commercial ports of Stettin, Danzig and Königsberg on the Baltic are sufficiently protected by older works and their submarine defences, against sudden attacks. The Baltic with the help of neutrals will not play an insignificant rôle in war as regards our mari-

time commerce. Its value will grow, and the time may perhaps come, when increased attention will have to be given to the coast defences of the Baltic; for example, if Russia were ever to convert into fact her desire to create a new naval Power, should the expected consolidation of the Baltic Powers not take place.

THE KIEL CANAL.

The fear expressed at different times that the German Navy will not be ready for war before the widening of the Kaiser Wilhelm Canal is completed, is not in keeping with the facts. The Canal is at all times navigable for all the ships of the High Sea Fleet, with the exception of the battleships of the "Nassau" and "Ostfriesland" classes, and the armoured cruisers "Moltke" and "von der Tann." Now that the First Squadron is permanently stationed in the North Sea, the widening of the Canal (at present unfinished) which was rendered imperative by the increasing size of the merchant ships and men-of-war and by the need of enabling the Kiel ships to reach the seat of war in the North Sea, is not of the strategic importance occasionally assigned to it in the event of German warlike operations.

This temporary disadvantage can be compensated for by suitable dispositions. The more so since there are sufficiently large docks in the Jade, Weser, and Elbe to accommodate damaged ships, even of the "Nassau" and "Ostfriesland" classes.

THE NORTH SEA.

In his book *Policy and Naval War*, the Austrian, Captain v. Labres, expresses the opinion that future naval operations against Germany will take place in the Baltic Sea; for the flat sandy coast of the North Sea, so far as German territory is concerned, is unassailable. The German river mouths are provided with an excellent natural defence, supplemented by strong fortifications, by the East Frisian Islands extending in front of them and by dunes and sand banks stretching far out to sea. Germany has thus at her disposal a series of absolutely unassailable places from which sorties could be made, such as the Ems, the Jade Bay with Wilhelmshaven and the mouths of the Weser and Elbe, while at the same time the strongly fortified island of Helgoland can be considered as an advanced post, signal station and base for destroyer flotillas. This excellently guarded coast is prolonged northwards by the flat shore of Schleswig-Holstein, which is afforded sufficient protection by the North Frisian Islands extending along its front, and by numerous other obstacles to navigation. That, at least, is the opinion of the Austrian naval officer.

One would like to be able to agree with what he says about the "self-protection" of the German North Sea coasts. It must be clearly understood, however, that not only the defence

of the coast itself, and providing immunity from a landing, are the tasks of the German defensive naval force, but also that the guaranteeing of freedom from blockade, and of unrestricted access to the centres of commerce, even in war, and particularly in war, must be the object and ambition of German naval preparations. These two points will be treated successively in the following pages.

The Elbe with Hamburg and the western entrance of the canal at Brunsbüttel, the Weser with Bremen, the Jade with Wilhelmshaven, the Ems with Emden, and finally, Helgoland and the Frisian Islands may be objects of attack.

Whoever has travelled from Cuxhaven to Helgoland by the "Cobra" cannot have failed to notice at various places the masts of sunken vessels, which are visible through the yellow water of the Elbe on both sides of the narrow, winding fairway, at one time projecting far out of the water and at another only just showing above the surface.

These vessels were driven here by the strong current of the Elbe which runs up to ten feet per second and changes direction within the hour; they were probably navigated by people unfamiliar with the continually changing and shifting shallows; the heavy sea, which is so frequently met with in these waters, cast them on to some sandbank, from which they could not get off, and their hulls were soon covered with rapidly accumulating quicksand. Only an experienced pilot can find his way downstream to the light ship Elbe I, even if all buoys and sea-marks are in place or if all lights are burning of a night. The voyage would be all the more difficult if the sea-marks were removed or altered. The reason why the foundations of Cuxhaven and Wilhelmshaven harbours cost such immense sums, is because the high and low tides, the continually changing stream, the large quantities of quicksand, and finally the muddy and slimy bottom allowed of no sure foundation on which to lay the masses of stone used in constructing the moles.

Some fifty years ago the survey of the Jade was commenced in Prussia. Whoever has looked at the maps representing the Jade at various times during these five decades will be astonished at the changes that have taken place in the sands and in the course of the river during this period. They explain, in conjunction with the frequent bad weather, the dense fogs, and the severe storms, the numerous accidents reported in the Press which occur in our German North-Sea river mouths, but—as there is a reverse side to everything—they afford at the same time most valuable protection to the trade centres and naval ports situated on them.

Again, these unfavourable natural conditions cause a strong race of born sailors to grow up on our coasts, men familiar with the dangers of the coast and sands, who form an excellent nucleus for the crews of our ships.

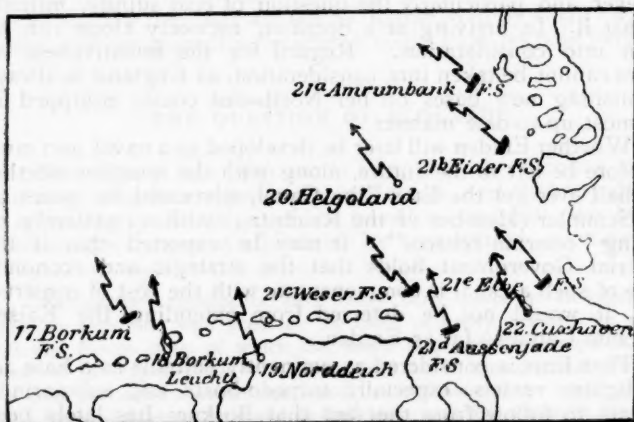
The difficulties in navigation which baffle an enemy are supplemented by numerous and strong fortifications. The three

river mouths are defended by three great coast fortresses. The arm of the Commandant of the fortifications on the Lower Elbe reaches as far up as the guns at Brunsbüttel, and right down to the mouth of the river, for the protection of which he has at his disposal, besides the long line of forts in the immediate and distant neighbourhood of Cuxhaven, a comparatively large number of torpedo-boats and other vessels, which, when not carrying out exercises on the Elbe, take up almost too large a portion of the new harbour of Cuxhaven.

Similarly, the Commandant of the fortifications on the Lower Weser, who is stationed at Geestemünde, has at his disposal forts and shore batteries, and the means of carrying on torpedo warfare, while a short series of fortifications extends on the Jade from Wilhelmshaven to Wangeroog along the coast. In

GERMAN WIRELESS TELEGRAPH STATIONS ON THE NORTH SEA.

(Map from *Marine Rundschau*, March, 1912.)



addition it may be assumed that in all three river courses there is an elaborate system of mines and other submarine obstructions, in accordance with the experience gained from the Russo-Japanese War. Germany, by instituting a special "Inspection of Submarine Mines," has been the first of all countries to further this new weapon by every means. From this fact it may be concluded that the German Navy has made the utmost of the lessons of the last war with regard to the mine as a weapon which is particularly adapted to defence, and especially suitable for German coastal waters.

Without a declaration of war the Japanese made a sudden attack, according to a carefully preconcerted plan, on Port Arthur; the Russians—perhaps owing to their own fault—were

by no means prepared for war or for an attack. There is no nation so versed in espionage as the Japanese. Their officers disguised in every possible way have resided by hundreds in all parts of East Asia, Singapore and Suez, Cairo, and Cape Town. Whatever was worth knowing, they got to know, and used in their war plans. They spared themselves no trouble and no labour, and were indefatigable and eager in keeping their eyes and ears open. And yet Port Arthur held out, and the first surprise attack on the land defences injured the Russians but slightly.

The reports which have been published latterly in different newspapers, that Emden is to be established as a naval port, have not been corroborated up to the present. There might be several reasons in favour of establishing a war base at Emden: its excellent position at the Western angle of our North Sea coast, its technical and economic resources, the desire to relieve Wilhelmshaven, which is already the third largest garrison in the German Empire, and other causes. Many disadvantages, however, and particularly the question of coal supply, militate against it. In arriving at a decision, necessity alone can be taken into consideration. Regard for the sensitiveness of others cannot be taken into consideration, as England is always establishing new bases on her North-east coasts equipped in the most up-to-date manner.

Whether Emden will later be developed as a naval port must therefore be left to the future, along with the question whether we shall ever get the Ems-Elbe Canal, advocated for years by Dr. Semmler (Member of the Reichstag) with a constantly recurring "ceterum censeo." It may be expected that if the Imperial Government holds that the strategic and economic value of such a canal is commensurate with the cost of construction, it would not be deterred from extending the Kaiser Wilhelm Canal as far as Emden.

That Ems is considered as eminently suitable as a base for the lighter vessels, especially torpedo-boats and submarines, appears to follow from the fact that Borkum has lately been strongly fortified. Perhaps this was determined by the desire at all events to prevent this valuable base from falling into the hands of an enemy by a sudden attack at the commencement of a war. Before Borkum was fortified, this would undoubtedly have been possible. If the Army has here relieved the Navy of a portion of the defence of the coast, and is thus taking its share in the defence of the North Sea, the fact is to be welcomed in so far as it constitutes a further bond between the two sister services which owe their existence to the same object.

Everyone who has ever made Helgoland a health resort is aware that it is secure against a sudden attack. English espionage, which has evinced particular interest in this once English island, will here be of no avail. For the island is easily guarded, the people easy of control, while everywhere armed sentries prevent trespassers from obtaining access to the guns.

which spring up from the red rocks on all parts of the island. It is for experts to say how far the island is of strategical importance. It is apparent even to the layman that Helgoland¹ will play a remarkable part in war as an advanced observation post and as a base for torpedo vessels. Its roadstead forms the only partially defended anchorage for large ships in the inner bight of the German North Sea. To-day this anchorage is commanded by numerous modern and well-protected German guns. No adversary can, therefore, make use of it.

Nothing is known as to the defence of the Frisian Islands, except that they are garrisoned and fortified even during peace. It may be assumed, that although they would scarcely be worthy objects of attack, extensive means are provided for their defence, especially against raids.

Let us here contradict just one error that occasionally appears in the Press, viz.:—that the shallows between the Islands and the mainland are navigable by ships. These waters are so shallow that they are not navigable even by small torpedo-boats, and consequently the enemy could have no base here.

THE QUESTION OF BLOCKADE.

Now that it has been made clear that the German coasts and river mouths are secure against attack, and that any danger of a landing is almost out of the question, we shall next briefly examine the danger of a blockade by an adversary considerably

¹Exhaustive experiments have lately been made in Helgoland, in order to determine with accuracy the effect of heavy artillery fire on the soft and friable stone of which the island is principally composed. The result of the experiments was satisfactory, as it was demonstrated that the most prolonged bombardment, and the explosion of the most powerful shells were unable to produce, as had been asserted would be the case, any great fall of rock.

These data are of extraordinary importance, because the conclusion had already been admitted by public opinion as inevitable, that the enormous sums spent on the fortifications and artillery of the island were of no use, if the island were unable to withstand a bombardment, or even the concussion of its own guns. The searching examination carried out by the Engineer Corps, leaves not the slightest doubt as to the solidity of even the most exposed and dangerous spots.

The slightly concave summit of the Island has been made bomb-proof, and the disposition of the batteries is such that they are entirely invisible to the enemy. The range of the heavy mounted guns is 12,000 yards. They are mounted on steel turrets 10 inches thick. All the batteries and observation posts have underground inter-communication by means of bomb-proof galleries, and the roads which unite the summit of the island with the lower sections are also protected against gunfire.

Revista de Marina.

superior at sea, and shew how the German coasts are defended or may be defended against such.

The first object of a naval war waged by a superior adversary against the German coasts would be to gain and keep the command of the sea. The idea of the command of the sea includes both the defensive and the offensive. *Defensive*, in so far as the country striving for the command of the sea pushes the limits of its own sovereignty across the sea, which is neutral in time of peace, right up to the enemy's coast, and there defends it; for the arm of the Power possessing the command of the sea reaches so far only.

Offensive, in so far as the command of the sea prevents the enemy having free intercourse over the sea, and so takes away from him something that he formerly possessed. *Offensive* too, in so far as a struggle for the command of the sea can only be carried on by offensive means. For the Power on the defensive cannot impose its will on the adversary.

A close blockade of the German North Sea coast would scarcely be practicable at the present day. A modern fleet requires a base not very far distant. It is dependent on coal and stores of all kinds. The time of the blockade was in the sailing-ship period. Then a fleet could blockade a port as long as food lasted, because its movements were not dependent on fuel, for the wind filled its sails every day. On the other hand, this same wind made it difficult for the blockaded force to escape without being observed, because it would only be possible to come out when the wind was in certain directions, and this would be known also to the enemy, who would keep a sharper look-out.

The freedom of movement possessed by the present-day ship, compels the blockading fleet to be fully supplied with fuel, while it leaves to the blockaded force the choice of time and place of a sortie, under cover of darkness without the enemy receiving any indication of their intention. Besides, as we have seen above, the resources for guerilla warfare of every kind are concealed in the German river mouths, and this kind of war, in its present state of perfection, would gradually wear out an enemy engaged in a close blockade of the coast.

The enemy must, therefore, choose between a distant blockade or a merely strategical position. A distant blockade places the blockade line outside the radius of action of small craft. The increase in the radius of submarines considerably lessens the chances of defence against them. The alternative plan removes the hostile fleets to a distance from the enemy's coast to some central position where they, themselves protected from unexpected attacks and surprises, constantly bar the way to an enemy should he desire to come out and seek a decisive action, and may annihilate him by an opportune concentration of force. In a war of this kind the Channel and the northern exit from the North Sea would be closed to German shipping by hostile cruisers.

A commercial blockade of this kind would lay the axe to the roots of our prosperity. Only a fleet which is suitable for sudden offensive action is in a position to prevent a blockade of this kind from being effective. Its chances lie in being able to choose the moment of battle. Whilst its normal attitude is the defensive it must be able to take the offensive, in order thus to impose its own will on the enemy.

We have endeavoured to shew that our coast defences appear to be sufficient against attack and against landing. There is no remedy against a surprise attack during profound peace. If an enemy should act thus, it is always possible that he may gain advantages which it will be difficult to counteract. Therefore it is the task of diplomacy to be informed beforehand of any tension which may exist, and to apprise the responsible military authorities, so that they may secure themselves against any danger by special precautions.

The only justifiable policy is to maintain in a high state of preparedness during peace those forces which are of primary importance for defence against attack, and, in case of war, to make such arrangements as will secure the readiness at the proper time of all the defensive forces. Quick preparation is everything in this age of wireless telegraphy, fast cruisers and torpedo boats.

We shall not investigate any further the part that a good system of coast defence plays in the course of a war. It will never take more than a secondary part in a war of this kind. For the best coast defence alone cannot prevent the sapping of our maritime commerce, now amounting to 70 per cent. of our total trade of £743,750,000 and the annihilation of our entire economic existence.

Only a fleet can do that—a fleet which is strong enough for the tasks outlined above, and which is also able to engage a considerable portion of an enemy's fleet with a prospect of success. It is not necessary to be equal in strength to the strongest of our possible adversaries. The inferiority of our fleet, whose strength will only be in conformity with our absolute requirements, secures the strongest naval Power from any intention of attack on the part of Germany, which no one among us cherishes. The corresponding requisite strength is the best guarantee of peace, a guarantee which not even the best coast defence can procure for us.



THE REVOLUTION IN CHINA.

(Continued from May JOURNAL, page 704.)

Recent reports from Peking demonstrate the gravity of the situation produced by the lawlessness of the numerous levies, which have been hastily raised and armed by both sides. These have been for the most part recruited from amongst the lowest and most worthless of the population, who, so long as there was a fair prospect of loot were content to submit to some form of discipline, even though they were irregularly paid. The establishment, however, of somewhat more settled conditions has not proved to their liking; and this, coupled with the inability of a bankrupt Government to guarantee regular payment, has resulted in numerous outbreaks, only a few of which have been mentioned in the Press. It is now estimated that there are in China some 850,000 men under arms. Even the better trained of these show scant respect for authority, and until the majority receive their arrears of pay, and are disbanded, they constitute the most dangerous element in the present situation.

On the 29th April, Yüan Shih-K'ai opened the first session of the Advisory Council of the Republic in the old Senate House. Eighty members were present out of the full 126. The representatives include five members for each of the 25 territorial divisions of China, with an extra member for Kokonor. Yüan-Shih-K'ai's address was devoted almost entirely to finance; and the stress was laid on the necessity for maintaining friendly relations with foreign Powers. The ceremony passed off without any untoward incident.

It was reported in the *Daily Telegraph* of the 18th May, 1912, that the newly-appointed military governor of Ili had been murdered, together with a civil official, during a rising of the Mohammedan population, who favour the restoration of the Monarchy.

Tibet.

The report of the fighting between the Tibetans and Chinese at Shigatse and Lhasa is confirmed. At the former place, the Chinese surrendered 130 rifles and ammunition, receiving the equivalent of about Rs. 8,000 for the expenses of their journey back to China. A despatch from Lhasa sent off on the 15th May, quoted in the *Times* of the 21st May, stated that the Chinese were hemmed in in the buildings in the southern suburbs. Their supplies of cartridges were exhausted, and their Maxims and artillery were silent. The besieged were feeding on dead transport animals. Their retreat was blocked by 15,000 Tibetans, who held both sides of the river.

THE WAR IN THE MEDITERRANEAN.

(Continued from May JOURNAL, page 709.)

(a) General.

ITALY: COST OF THE WAR.—The official Gazette published two Royal Decrees, dated 14th April, authorizing a new extraordinary credit of seven million lire for the Minister of the Interior, and another, for the Minister of War, of 28 millions on account for the campaign in Libya.

TURKEY: DARDANELLES.—The Dardanelles were opened for traffic on 18th May, and all westward bound vessels have now left.

There are rumours that the Russian Black Sea grain shippers are putting forward a claim against the Turkish Government for losses alleged to be due to the closing of the Dardanelles.

DEFENCES OF THE BOSPHORUS.—Rumours are current as to the contemplated move of troops to Biyukdere and the placing of mines at Kilios (a landing place on the Black Sea, near to the Bosphorus entrance).

KHIOS AND MITYLENE.—Newspaper reports announce that reinforcements have been despatched across to Khios and Mitylene from Cheshme and Aivalik respectively. On the 11th May, 1,300 troops were reported to be in Khios and 2,000 in Mitylene. 5,000 more, with an ammunition reserve are reported to have commenced embarking for Khios on the 16th.

The centre of interest during the past month in regard to the war has mainly turned upon the Italian operations in the Southern Aegean. The capture of Rhodes during the early part of May has formed the main feature; this, however, was accompanied by the occupation of practically all the islands as far north as Samos (excluding that island).

As to the ultimate intention of Italy in regard to the islands captured, various indications point, in the case of some of them, to a prolonged occupation, if not to eventual retention. The Turks on their part still profess themselves indifferent to the capture of the islands, and state that their loss can in no way influence the main position in Tripoli. As a measure of reprisal, an Imperial *Irade* has been promulgated, enlarging the present limited expulsion decree, and all Italians resident in Turkey, with certain exceptions, were ordered to leave within 14 days from the 21st May.

(b) Naval and Military Operations.

Operations in the Aegean.

OCCUPATION OF RHODES.—On April 17th plans were arranged in Rome for the occupation of Rhodes, and at the end of the month the Expeditionary Force was assembled at Tobruk. The troops, who were under the command of Lieut.-General Ameglio, included the 4th Bersaglieri and 57th Regiment from Benghazi; one Alpini battalion from Tripoli; 34th Regiment at Tobruk; two field and two mountain batteries, various machine-gun sections, a detachment of cavalry, one or more companies of engineers, and medical and supply services.

The Colonial Section of the General Staff at Rome had issued a handbook of the island of Rhodes for the use of the Expeditionary Force, and copies were distributed to every officer. It is a book of about 27 pages, with appendices giving itineraries, and topographical information both from Turkish and Greek sources. A map of the island on a scale of 1/120,000, and a plan and view of the town of Rhodes are included.

Seven transports were used, of a total tonnage of about 26,000 tons. The force embarked on May 1st, and was escorted by four battleships and cruisers, four destroyers, and some sea-going torpedo-boats.

The naval force under Admiral Viale, which had sailed from Taranto on the 30th April, met the convoy of transports between 2 a.m. and 2.30 a.m. on the 4th May, and at dawn the fleet arrived off the north-east point of the island of Rhodes. Part of the fleet demonstrated against Rhodes harbour and town, while the troop transports proceeded to Kalitea Bay, eight miles south of the town. The disembarkation began at 6 a.m.; two tugs drawing the first tow landed a covering party of three companies of sailors; these were followed by 50 rafts and as many boats, towed three, four, and five at a time, by the launches of the fleet; in less than two hours 8,000 troops had been disembarked. After the men had been landed, the disembarkation of artillery, machine-guns, ammunition, horses, vehicles, and supplies of all kinds began. The landing was unopposed, and was completed by 2 p.m.

The first objective was the village of Koskin; thence a small column was directed against Kopful, whilst the main body advanced against Asguru and Sandruli. The Turkish garrison of the town of Rhodes had withdrawn to a range of hills, where, with the assistance of the fleet, they were attacked and defeated. The Italian troops bivouacked for the night on the hills around Sandruli, and reached Rhodes next day. On the afternoon of the 5th May the Italian flag was hoisted over the town. Large quantities of stores have since been landed at Rhodes, as if for a prolonged occupation.

The Italian casualties numbered seven wounded; and the Turks are said to have lost 23 killed, 48 wounded and 57 prisoners, including one officer. The rest of the garrison, which is estimated to have numbered 3,000 escaped during the night into the hills about Psithos.

MOVEMENT AGAINST PSITHOS (*Agenzia Stefani*).—General Ameglio received information which showed that the Turks intended to withdraw south from Psithos, and organize guerilla warfare in the hills. He determined, in consequence, to lose no time in attacking the enemy and in cutting off their retreat into the interior of the island. He left in the City of Rhodes a garrison consisting of infantry and sailors, with two batteries of field artillery, and formed three columns with the remainder of his force.

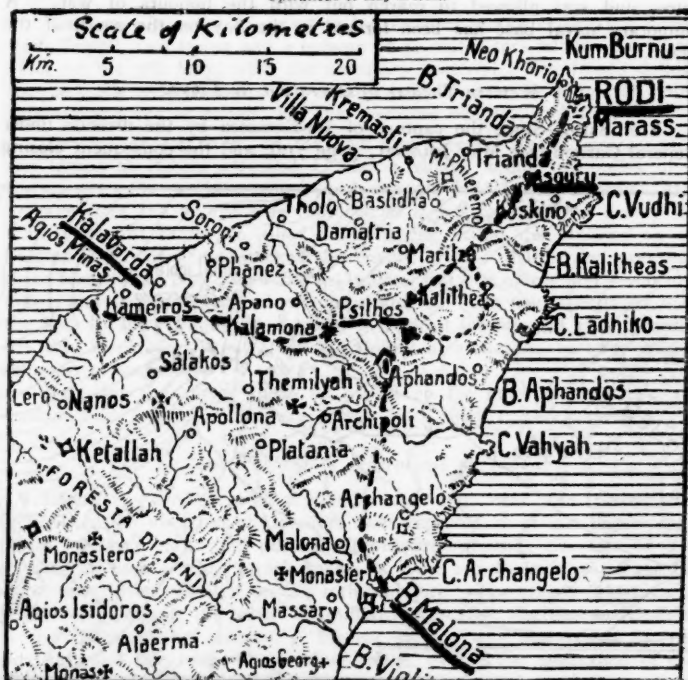
Two columns embarked at Rhodes in the afternoon of the 15th, and disembarked between 9 p.m. and 12 p.m., one at Kalavarda, on the west of the island, and one at Malona, on the east coast. The Kalavarda column (three battalions 4th Bersaglieri, two machine-gun sections; about 1,600 men) was escorted by the "Regina Margherita," and the "Saint Bon"; the Malona column (one machine-gun section, one battalion 3rd Alpini; about 800 men) by the "Emmanuele Filiberto." The disembarkation took place without a moon and with all lights extinguished.

Meanwhile the principal column, under General Ameglio (34th and 57th Infantry, two squadrons cavalry, three batteries mountain artillery; about 5,000 all ranks), left Rhodes at 7 p.m.

General Ameglio's column marched *via* Asguru with Psithos as its objective, over a rough and mountainous road; the distance was 25 miles. The Kalavarda column marched with its first objective Kalopetra, and its second Psithos, a distance of 18 miles. The Malona column marched along the Malona—Platania Road, on to the heights north-east of Acropolis, and thence on Psithos; 20 miles in all. On May 16th, at 9 a.m., the three columns gained touch with each other.

NORTHERN END OF THE ISLAND OF RHODES.

Operations of May 15-17th.)

[From the *Corriere della Sera*.]

The Turks, who were surprised, tried to break out in various directions, but were driven back by the Bersaglieri and the fire of the "Saint Bon,"¹ directed on to the Maritza Road. Threatened on their right flank by the Bersaglieri, in front by the Alpini battalion, 57th Regiment, and a battery, and with their left turned by the 34th Regiment and two batteries, the enemy made a desperate resistance, but withdrew, and finally dispersed in the ravines near Maritza. At 11 p.m. on the 16th a flag of truce with an offer of surrender was received, and the Turkish troops laid down their arms at 9 a.m. on the 17th May. Eighty-three dead, 26 wounded, and 144 rifles, were found on the field; the Turkish commander, 33 officers, and 950 men surrendered, handing over six mountain guns, with ammunition and mules, 200 boxes of ammunition, and 700 rifles.

¹ The "Saint Bon" lay off Villa Nuova on the N.W. coast.

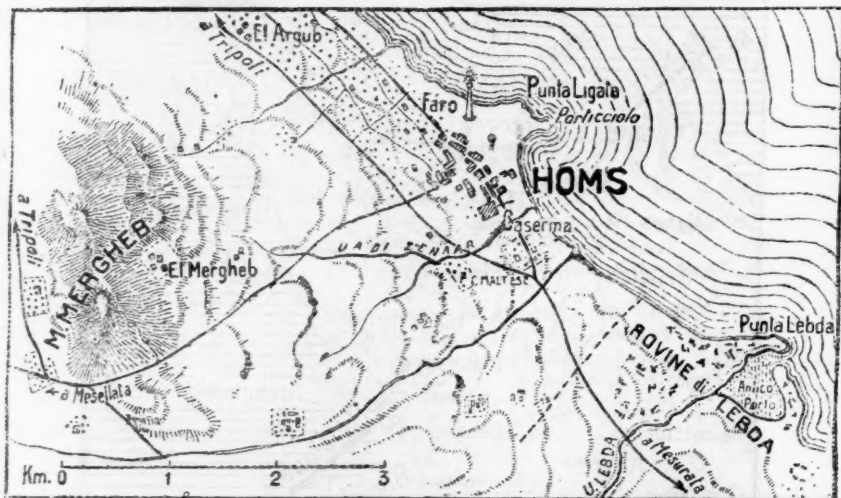
On May 18th Admiral Amero destroyed the Turkish barracks at Marmaritza, opposite Rhodes.

The following islands in the Aegean have now been occupied by the Italian fleet:—Stampalia, Neros, Piscopos, Kharki, Rhodes, Scarpanto, Casos, Karpathos, Patmos, Kalimnos, Lipsos.

In order to complete the capture of the island of Stampalia (or Astypalia), Admiral Presbitero landed two companies to seize the heights commanding the town of Livadhia, by surprise. At dawn on the 28th April, the small garrison, finding itself surrounded, sent out a flag of truce, and was allowed to march out with the honours of war. A temporary naval base has been formed in the bay on the south of the island.

Western Theatre of Operations in Libya.

SIDI SAID.—Since the capture of Bu-Kemessa by the division under General Garioni (see May JOURNAL, page 712), and the consequent closing



[From the *Corriere della Sera*.]

of the coast road, two new routes have been opened for contraband trade across the Tunis frontier, by Bir-Melitta and Nalut.

On the 22nd April the 6th Battalion Askaris went out in the morning some three miles away from Bu-Kammesch to reconnoitre for wells. On the return journey they were attacked by the Turco-Arabs from the direction of Sidi-Said. The Askaris took up a position, and were supported by one battalion, 60th Regiment, and another battalion of Askaris. Two field batteries and a mountain battery also took part in the action. The 60th Regiment and the Askaris counter-attacked, and the enemy was driven back at 5 p.m. During the action Lieutenant Palmadi Asnola flew over in his aeroplane. The Italians lost seven killed and 60-70 wounded. Over 100 Arab bodies were found within 1,200 yards of Fort Bu-Kemessa.

On the 3rd May, General Garioni made a forward movement to the southward with a mixed force, consisting of one battalion of the 60th Infantry, one Askari battalion, machine-gun sections and engineers. After a short march, about 2,000 of the enemy were discovered, entrenched and supported by cavalry and machine-guns. The Askaris were at once launched to the attack, supported by the 60th Infantry, and the position was assaulted with the bayonet. The enemy fled, leaving behind hundreds of rifles and other arms. The Askari battalion, which was in the front line, and bore the brunt of the fighting, lost five men killed and 40 wounded.

TRIPOLI.—In order to complete the fortified works connecting Tajura with Tripoli, two trains and a column of 30 motor cars left for the former place on the 7th May, with the necessary material. The troops detailed for the work were covered by a cavalry brigade, four battalions of Italian infantry and one of Askari, but the operation was not molested.

HOMS.—At 4.45 a.m. on the 2nd May General Reisoli, commanding the troops at Homs, attacked Lebda, a village about two miles along the coast to the south-eastward, and strongly held by the enemy. After a fierce fight the village was captured at 6.30 a.m., and the enemy fled with a loss of some 300 killed. During the action the Italians on the heights of El Mergheb attacked the enemy in that district and prevented them from reinforcing Lebda. The Italians lost one officer and seven men killed, and three officers and 54 men wounded. The troops engaged were the 89th Infantry Regiment, a battalion each of the 6th and 37th Infantry, the 8th Bersaglieri, the Mondori Alpini, a mountain battery, and a company of engineers.

Next day the enemy made an attack on the new positions that the Italians had fortified, but were driven back with considerable loss.

Eastern Theatre of Operations in Libya.

BENGHAZI.—On the 26th April the new fort near the Castellaccio redoubt, in the direction of Gariunes, was reported as at last nearly completed. Seven days had passed without any alarms; the last of any importance was a night attack made by some 200 Bedouins against this work, soon after midnight on the 19th and 20th. The enemy first became visible on entering the area illuminated by the electric search-light in the neighbouring redoubt. Perfect silence was maintained by the garrison, and fire reserved for close range. With the assistance of the guns in the redoubts the attack was repulsed in a few minutes without loss.

(c) *Aeronautics.*

DIRIGIBLE RECONNAISSANCES.—On the 1st May the two dirigibles went out: "P₃" against Suani-Beni-Aden, and "P₂" as far as Aziziah. The "P₃" is said to have made wonderful practice, dropping four bombs into the very centre of a camp, which covers an area of less than 240 square yards, and setting all the tents on fire. The smoke from the conflagration and the bursting bombs prevented the crew of the dirigible from observing the losses among the personnel, but they are considered to have been heavy, as the bombs are in the nature of shrapnel shells, with 300 bullets each, in addition to the effect of the suffocating gases of the "Trotil" explosive. The "P₂" parted company with the "P₃" near Suani-Beni-Aden and continued her voyage to Aziziah, the Turkish head-

quarters, about 28 miles from Tripoli, and halfway to Garian. A strong head wind retarded her speed to such an extent that it was deemed prudent to make a detour and pass the village at a distance of two miles. The dirigible was then turned and came down wind at a speed of 56 miles an hour. The enemy opened fire with rifles and guns, but the "P₂" was soon out of range, having dropped 28 bombs. The dirigibles flew at a height of 3,000 feet, and were three hours away from their hangars.

On the 6th May the "P₂" and "P₃" made further reconnaissances; the former to Aziziah, chiefly with a view of taking photographs of the enemy's positions. The "P₃'s" route was to Suani-Beni-Aden, Zavia, Buaisah, and Zanzur.

AEROPLANES.—Six two-seated aeroplanes, each accompanied by a pilot and an observing officer are being sent to Libya.

Captain Moizo and Lieutenant Gavotti are returning to Italy, after six months hard service. Each aviator has made about 80 flights, and the work has been so severe that it is said these officers will not be allowed to fly again for two years.

The Italian aviation officers are said to consider that the Bristol machine is the best aeroplane now made, although it is difficult for beginners to learn upon, as the control is very sensitive.

THE SPANISH OPERATIONS IN THE RIFF.

(See map in April JOURNAL, facing page 570).

With reference to the operations on March 22nd, referred to in the April JOURNAL, page 569, it appears that General Navarro's column, which suffered so severely, consisted of four battalions, two squadrons, and a battery, in all about 3,000 men; it had camped at El Harcha, and, on the day in question, was operating on the south of the other four columns which gained possession of Mount Tumiat. While this place was being occupied and entrenched, General Navarro had deployed his forces opposite Zoco El Arbaa De Zebuya, and was exchanging shots with the Moorish forces in his front. At 3 p.m., when Mount Tumiat was entrenched and General Navarro was ordered to withdraw, the Moors attacked at once, with great determination, and the column withdrew slowly and with some difficulty. The losses already mentioned were incurred during this retirement.

Events in April.

GENERAL ALDAVE'S PROCLAMATION.—General Aldave issued a proclamation, in which he assured the Kabilas of the Riff, that Spain desired their welfare, and advised them to return with their families to their villages, in which case the past would be forgotten. This proclamation has been widely distributed among the hostile Kabilas, and is already bearing fruit, many of the rebels having come in with their families, and made their submission.

SPANISH PLANS.—On the 8th April the *Imparcial* reported the arrival at Melilla of General Jordan, with instructions from Madrid, and suggested that the next step contemplated would be the occupation of one or more

positions; one of them commanding the Zoco de Zebuya; and perhaps El Tidnit and Bucherit, where the hostile *harka* was then encamped. The occupation of these posts would complete the line of fortified positions commanding the River Kert; and the routes, hitherto open to the Moors, would then be safeguarded. The occupation of the Jebel Mauro on the left bank of the Kert would, it is added, be of no advantage, as this ridge is commanded by other heights further west.

These operations completed, and all the encampments efficiently provided with artillery, the time would have arrived for reducing the garrisons. This measure and the consequent reduction of the daily convoys required for the needs of the 42,000 troops now serving in the Riff, would enormously reduce the expenses of the war.

Events in May.

Operations were resumed in May, apparently in connection with the execution of the plans outlined above.

At the beginning of May the Spanish columns had been carefully reconnoitring the region between Hianen, Ulad Ganem, Hadduya-Kaddur, and Tauriat Hamet; and between the rivers Bugardám and Ajundac. On May 10th, it was reported that large bodies of the Moors were crossing the Kert at the Zoco de Zebuya, and concealing themselves in the gorges on the right bank of the river. General Navarro moved from Yadunem to the Harcha position. Next morning more of the enemy crossed the Kert. Their object was apparently to penetrate by night between the Harcha and Texdra positions.

On May 11th, a battalion and a battery moved out at 8 a.m., and occupied a position near Mount Tauriat, while a squadron of cavalry operated on the left flank.

Fighting began at 11 a.m., and two battalions were sent out in support from Hianen. The Moors tried to get into the valley of Maxin, but were driven back, and at 6.30 p.m., General Navarro, who had taken command, returned to Yadunem, with the loss of one officer killed and five wounded.

On May 13th, the Moors, who had been assembling again east of the Kert between Tauriat Hamet and Ulad Ganem, were attacked by four Spanish columns.

At daybreak General Navarro's column (four and a half battalions, two squadrons, and two mountain batteries) advanced from Yadunem, under cover of artillery fire from Texdra and Harcha, against the heights of Tauriat Hamet and Ulad Ganem. His column soon encountered the Moorish forces which had entrenched themselves at Haduya and the hamlet of Tauriat Hamet. From the outset the fighting was severe. Three times the Taxdirt squadrons charged the rising ground of Tauriat Hamet at full gallop, the enemy offering desperate resistance. It was during this fighting¹ that the Moorish leader, El Mizzian, was killed (see below). Soon after, two battalions, with cavalry on right and left wings, crowned the slopes, on which the enemy left many dead, and many arms. By 8.30 a.m. General Navarro was master of the villages of Hianen, Tauriat Hamet, and those about Haduya, which were burnt so that they should no longer give shelter to the Moors.

Meanwhile, General Herrero's column had covered General Navarro's left flank, between the rivers Bugardám and Melha; General Molto, who

¹ According to later accounts, El Mizzian was killed in a subsequent skirmish at the same spot, on the 15th.

had advanced from Iz Hafen, was at Habusaten (? Ibuchaten), near the Kert and the old *soco* of Zebuya, protecting his right; General Rodriguez, from Avanzamiento, moved up to the positions Ulad Ganem and Tauriat Hamet. Defensive works, for which the necessary material had already been sent forward, were at once commenced by the four companies of sappers accompanying the force, and at 2 p.m., when the works were well advanced, General Molto's column, which had occupied the most exposed position, was withdrawn to Iz Hafen. The enemy, under the impression that a general retirement was about to take place, attempted to cross the Kert in great numbers, but Herrero's column kept them in check, and General Molto's withdrawal was easily effected.

General Navarro was left at Kaddur, the most advanced position, with four battalions, two batteries, and two companies of sappers, until the works there had been completed, after which the garrison at that point was reduced to one battalion and one battery. Six companies and two batteries were left to hold the heights of Ulad Ganem and Tauriat Hamet.

The Spanish had two officers and 11 men killed, and five officers and 42 men wounded.

THE DEATH OF EL MIZZIAN.

The death of El Mizzian, which took place as above mentioned in the fighting near Ulad Ganem, is said to have had a most discouraging effect on the Moors, and may possibly lead to a conclusion of the war. It appears that the Moorish leader, at the head of some horsemen, rode towards the Spanish native regulars, haranguing them, calling out his name, and ordering them not to shoot. The native regulars fired, killing El Mizzian and many of his companions; the remainder fled, abandoning the corpse, which was picked up by the Spaniards, and identified as that of the Sherrif. He wore round his neck a rosary with four amulets, inscribed with verses of the Koran, and a silver badge engraved with his name, and a seal, having the words "Mohammed El Mizzian" at the top. Firing having ceased, H.Q., escorted by the Taxdirt force, bearing the corpse of El Mizzian on a mule, marched back to Avanzamiento. Both at this place and on arriving at Melilla, the excitement was intense, and a company of infantry hardly sufficed to restrain the curiosity of the people to see the corpse of the famous guerilla leader.

Reorganization of the Melilla Forces.

The Brigade of Cazadores at Yadumen (one battalion at El Harcha) consists of 12 battalions, two machine-gun groups, two squadrons, two mountain batteries, ammunition column, one company engineers, one signal section, 1 field ambulance.

The Ceuta Brigade at Yadumen consists of one regiment, one battalion, one machine-gun section, one squadron, one mountain battery, half field ambulance.

Under the Commander-in-Chief's orders at Melilla are two squadrons, two mountain batteries, ammunition columns, signal section.

At Nador, one squadron, one railway company, one aeronautic company.

At Avanzamiento, one cavalry regiment, sections of mounted infantry, mobile park.

At Zeluán, three squadrons, and divided between Mount Tumiat and Zaio, one squadron.

The provisional division at Zeluán has been broken up, and the following arrangements made:—

One division, headquarters—Ras-El-Medua.

1st Brigade at Iz Hafen; four battalions, one machine-gun group, one squadron, one mountain battery, one signal section, half ambulance section.

2nd Brigade at Ras-El-Medua; four battalions, one machine-gun group, one squadron, one mountain battery, one signal section half ambulance section. Attached, one mountain battery, ammunition column.

INDEPENDENT BRIGADES.—2nd Brigade, 1st Division, at Nador (with one battalion detached at Tauriat Harrich); two regiments, machine-gun group, one mountain battery, signal section.

2nd Brigade, IVth Division, at Zeluán (one battery at Mount Aruit); two regiments, machine-gun group, one company engineers, one signal section, one field ambulance.

1st Brigade, Vth Division, at Avanzamiento; two regiments, machine-gun section, two mountain batteries, one company engineers, signal section, one field ambulance.

Administrative troops and native levies are distributed in various convenient places.

Battalions garrisoning Tauriat Harrich, Mount Aruit, El Harcha, Ras Medua, Hudrar, Tauriat-Zag, and Tauriat-Buchi, are relieved monthly by other battalions from their own brigades.

MACHINE-GUNS.—There are now 14 groups of machine-guns, each group consisting of two sections of two machine-guns.

These groups are allotted one to each of the following brigades:—

Ist Division, 1st and 2nd Brigades; IInd Division, 2nd Brigade; IVth Division, 2nd Brigade; Vth Division, 1st Brigade; one group to each brigade; Ceuta Brigade; 1st and 3rd Brigades of Light Infantry; Melilla Division, four groups; two light infantry battalions, two groups.

NAVAL AND MILITARY CALENDAR.

MAY, 1912.

- 4th (Sat.) Landing of an Italian Expedition on the island of Rhodes.
- 10th (Fri.) H.M.S. "Triumph" paid off at Chatham.
- 13th (Mon.) Spanish victory at Ulad Ganem (Melilla); death of the Moorish leader El Mizzian.
- 16th (Thurs.) Defeat and capture of the Turkish garrison of Rhodes.
- 18th (Sat.) Launch of battle-cruiser "Kongo" from Messrs. Vickers' Works at Barrow-in-Furness, for Imperial Japanese Navy.
- " " Launch of first-class battle-ship "Texas" from the Newport News Shipbuilding Yard, for U.S. Navy.
- 25th (Sat.) Attack on Fez by the rebellious tribes.
- 29th (Wed.) H.M.S. "Minerva" paid off at Chatham.
- 30th (Thurs.) Launch of 2nd-class cruiser "Melbourne" from Cammell & Laird's Yard, Birkenhead, for Royal Australian Navy.

NAVAL NOTES.

BRITISH EMPIRE.

THE KING.

INSPECTION OF THE FLEET.

His Majesty inspected the fleet assembled at Portland on the 8th, 9th, and 10th of last month.

The force assembled consisted of the First, Second, Third, and Fifth Battle Squadrons, with the First, Second, Third, and Fifth Cruiser Squadrons, the Second and Fourth Destroyer Flotillas, and six submarines. The first-named three battle squadrons are fully manned, but the fourth is a nucleus crew squadron; similarly the first three cruiser squadrons are fully manned, while the Fifth Squadron has only nucleus crews. The First and Second Battle Squadrons were each a ship short; while the Third Battle Squadron, hitherto known as the Atlantic Fleet, consists of six ships of the "Formidable" class. Altogether there were 27 battle-ships present, with 15 armoured cruisers, including the four battle-cruisers of the "Indomitable" type. In addition were the two protected cruisers attached to each battle squadron for scouting duties, and 16 auxiliary and repair ships. The Second Destroyer Flotilla had 13 boats, and the Fourth Flotilla 12 boats present; while of the six submarines, three were of the "D" class, the largest completed underwater craft in the world, having a displacement of 604 tons, and engines indicating 1,200 H.P.

The King embarked on board the Royal Yacht at Portsmouth at 1.15 p.m. on the 7th, leaving the harbour at 2.45; but owing to fog the yacht had to anchor off Yarmouth for the night, and did not arrive at Portland until the following morning (Wednesday). As the weather still continued foggy, it was impossible for His Majesty to proceed to sea with the fleet, as had been intended, for exercises; he, instead, inspected the new battleship "Orion," the flagship of Rear-Admiral H. G. King-Hall, C.V.O., C.B., D.S.O., the battle-cruiser "Indomitable," flagship of Rear-Admiral Sir George Warrender, Bart., K.C.V.O., C.B., commanding Second Cruiser Squadron; the new second-class cruiser "Yarmouth"; the destroyer "Swift," and submarine "D4," in which, accompanied by the Prince of Wales, he made a lengthy run, when submerged.

He also witnessed a most interesting exhibition by naval airmen, who demonstrated, in spite of fog and adverse atmospheric conditions, the wonderful proficiency with which they handle their machines. Four officers took part in the exhibition—Commander C. R. Samson, on the Short hydro-aeroplane; Lieutenant Longmore on the Deperdussin monoplane, bought in France; Lieutenant Gregory on a Short biplane, and Captain Gerrard, R.M.L.I., on a Nieuport monoplane. All four airmen went out to meet the Royal Yacht in the morning, and in the afternoon, the fog clearing away, a fine display was made. Commander Samson took the hydro-aeroplane round the fleet, and then made a *vol-plané* to the surface of the water, just between the "Victoria and Albert," and the Admiralty yacht "Enchantress;" rising again from the sea he flew off for another cruise, making a fine right-hand turn as he passed near the "Neptune," the flagship of Admiral Sir G. Callaghan,

G.C.V.O., K.C.B., commanding the Home Fleets. Lieutenant Gregory took a bluejacket with him as a passenger, and for half an hour carried him round the fleet; he also took out with him a 300 lb. weight to represent a bomb, and at a safe distance from the yacht dropped it at a mark for the King to see the effect, and it is important to note that when the weight was released it did not in any way affect the stability of the machine.

On the next forenoon His Majesty embarked on board the "Neptune," and at a quarter to twelve the fleet weighed and stood out into the Channel for squadron gun practice, but the atmospheric conditions were such that the squadron firing could not be carried out; although during an interval when the fog cleared off, the King witnessed some battle practice from the "Neptune." On the 10th, he embarked again on board the "Neptune," and the fleet, consisting of the First and Second Battle Squadrons, and the Second Cruiser Squadron, put to sea, and the weather being favourable, battle practice at 7,000 yards was carried out; the firing being excellent, and the targets riddled. When the practice was completed, the King witnessed an attack by submarines on the "Neptune" and "Hercules," the submarines discharged torpedoes with dummy heads, and many hits were made. His Majesty expressed himself as highly pleased and gratified at the results of the day's programme—both firing of the ships and the submarines' attack.

The King concluded his visit to the fleet on the 11th (Saturday), and before his landing from the Royal Yacht made the following signal to the flagship of the Commander-in-Chief:—

"Before leaving I wish to express to you my satisfaction at finding the fleet under your command in such a high state of efficiency. I was glad to have the opportunity of inspecting vessels of the latest type, and of witnessing squadron firing, an attack by submarines, and flights by aeroplanes. Will you express to the officers and men the pleasure it has given me to be again with them during the last three days."

Home.

The following are the principal appointments which have been made:—

Admirals—Sir Edmund S. Poe, G.C.V.O., K.C.B., to be First and Principal Naval Aide-de-Camp to the King, in succession to Admiral Sir L. A. Beaumont, G.C.B., K.C.M.G.; Sir W. H. May, G.C.B., G.C.V.O., to be Umpire-in-Chief during the naval manœuvres. Vice-Admirals—The Hon. S. C. J. Colville, C.V.O., C.B., to be the Vice-Admiral Commanding the First Squadron; H.S.H. Prince Louis of Battenberg, G.C.B., G.C.V.O., K.C.M.G., to command a fleet during the manœuvres. Rear-Admirals—D. Beatty, C.B., M.V.O., to command a cruiser squadron during the manœuvres; C. J. Briggs to command the Fourth Squadron; G. H. W. Moore, C.V.O. to be a Lord Commissioner of the Admiralty; F. E. E. Brock to be Admiral-Superintendent at Gibraltar. Captains—G. M. Paine, M.V.O., to be Commandant of the Central Flying School; D. R. Nicholson to "Conqueror"; R. S. Phipps-Hornby to "Inflexible"; C. D. Johnson to "Actæon"; G. C. Marescaux to "Implacable." Commanders—B. St. G. Collard to "Ganges"; P. W. Hill to "Pelorus."

Admiral (acting) Sir G. R. Callaghan, G.C.V.O., K.C.B., on appointment to the supreme command of the Home Fleets, has been succeeded in the command of the First Battle Squadron by Vice-Admiral the Hon.

S. C. J. Colville, C.V.O., C.B.; Sir G. Callaghan will presumably continue to fly his flag in the "Neptune," and it is not yet stated in what ship Vice-Admiral Colville will fly his.

The first-class battleship "King Edward VII." completed to full crew on 14th May, as flagship of the Second Battle Squadron, and the flag of Vice-Admiral (acting) C. Burney, commanding the Third Battle Squadron has been transferred to her from the battleship "Prince of Wales." The battleship "Queen," recommissioned at Devonport on the 15th ult., and the flag of Vice-Admiral (acting) F. P. Hamilton, commanding the Second and Third Fleets has been transferred to her from the "King Edward VII." The battleship "Magnificent" relieved the first-class cruiser "Theseus" on the 13th ult. as sea-going tender to the Devonport Gunnery School. The third-class cruiser "Pelorus" commissioned at Devonport on the 21st ult., to relieve the "Proserpine," a sister-ship, in the East Indies.

Naval Visit to Manchester.

In response to an invitation from the Manchester City Council, the Admiralty consented to a division of destroyers visiting that City at Whitsuntide. The division consisted of the "Amazon," "Mohawk," "Nubian," and "Zulu," and they were escorted by the second-class cruiser "Bristol." The vessels arrived at Manchester on Friday, the 24th ult., and left again on Tuesday, 28th ult.

FRANCE.

The following are the principal appointments which have been made :—

Capitaines de Frégate—A. E. Boissel-Dombrevail to "Arbalète," and command of Fourth Torpedo Flotilla of First Fleet; F. J. M. Thomas de Closmadene to "Fanfare," and command of Fifth Torpedo Flotilla of First Fleet; L. L. Mangematin to "Bourasque," and command of Bizerta Torpedo Flotilla; J. A. Robez-Pagillon to "Mousqueton," and command of Torpedo and Submarine Flotillas at Toulon; M. C. Jobard to "Epée," and command of Submarine Flotilla of First Fleet; J. Pérot to "Fantassin," and the Third Torpedo Flotilla of First Fleet.

Journal Officiel de la République Française.

The armoured cruiser "Montcalm" is being brought forward for commissioning at Brest; according to present arrangements she will commission on the 1st October to relieve the armoured cruiser "Dupleix" as flagship in Chinese waters, and will leave for her destination on the 2nd November.

Steam Trial.

The new destroyer "Dague" has successfully completed her trials off Lorient, having attained the exceptionally high speed of 33.12 knots on her full-speed run. The following are her dimensions :—Length, 246 feet; beam, 22 feet; displacement, 730 tons, with a draught of nine feet seven inches; her engines develop 13,000 I.H.P., and her armament consists of two 3.9-inch guns and four 9-pounders. The contract speed was for 31 knots, so the contractors receive a bonus of £2,500.

New Dry Dock at Lorient.

The Minister of Marine has decided on the construction of a third dock at this port, which will be constructed at Pré-Aux-Vases (formerly

Fosse-aux-bois), on the left bank of the Scorff, at the bottom of the harbour; it will be 800 feet long and 150 feet wide, and will be a covered basin, where battleships can be constructed, as is often done in England, thus doing away with launching. Dock No. 2 at the port is to be lengthened from 570 to 670 feet, and its breadth increased from 94 to 120 feet.

Ships on Trials.

The Minister of Marine has issued a memo, defining the position of the flag-officer presiding over the Trial Commission:—

"The President of the Trial Commission," says the memo, "lays down the nature and conditions of the trials; he may give his opinion as to the carrying them out, but his opinion does not constitute orders to the commanders of the ships on whom full responsibility rests, as defined by the present regulations."

The same memo further lays down that a flag-officer embarking on board a ship only commissioned for trials to superintend them is not to hoist his flag, since he is exercising no real command, and were his flag flown it would necessitate visits of ceremony and saluting, incompatible in most cases with the circumstances of the ship.

The Fore Turret of the "Liberté."

The fore turret of the "Liberté," with its two 12-inch guns, which disappeared when the ship was blown up, and of which no traces could be found, has now been discovered by the divers some 500 feet to the southward of the wrecked ship, at a depth of 33 feet; it is partly buried in the mud.

Professional Naval Schools.

M. de Lanessan, late Minister of Marine, has laid before the Chamber a proposal for the creation of naval professional schools; the object of the proposal is to create in the war and commercial ports naval professional schools, where the children of *Inscrits Maritimes* would be received by preference; to organize these schools so that the pupils would be admitted with their primary instruction brevet, and remain there until they were pronounced fit to obtain one or more brevets for special knowledge, and had acquired general knowledge sufficient to allow of their reaching the rank of petty officer. It would be necessary for the pupils on entering these special schools to engage to serve for 10 or 12 years.

This simple explanation allows us to consider the usefulness of these schools. With the progressive diminution of the length of active service in the fleet, the time passed by the seamen in the schools in order to become qualified to fulfil their duty on board a ship of war absorbs an excessive portion of their time of active service. One can count about a year before a man becomes a trained seaman, longer even if he is to become a gunner. When a man remains only three years in the service the period of training accounts for a third of it, and he is only useful for two years; if it were possible to conceive the adoption of two-years' service in the Navy it is evident that it would be necessary to have an *effectif* double of that now required to man the fleet in time of peace.

The reduction of the term of active service, at the same time as the necessity of developing the training of the men proportionately with the progress realized in the engines of war, has entailed a considerable increase in the expenditure on the naval schools. The professional naval schools, in giving to the service men already trained, and engaged to serve

a long term in the fleet, will not only provide a useful contingent of seamen, but will sensibly reduce the cost of instruction.

M. de Lanessan, while he was Minister of Marine, made the necessary arrangements for creating some naval professional schools. A commencement was made at Bordeaux, but his successor did not follow the idea up.

Le Temps, La Vie Maritime and Le Yacht.

THE NAVY AND THE MEDITERRANEAN.

In a recent No. of the *Action*, M. de Lanessan gives his views as follows:

"I learn, indirectly," he writes, "that an Italian journal of standing seeks to quarrel with me on account of my lecture on the naval programme, on which I am said to have spoken of the Mediterranean as a 'French Lake.' I am afraid that my Italian *confrère* has drawn false conclusions. Because nowhere in my lecture does the phrase 'French Lake' occur. I content myself by saying, and it is necessary to repeat it, that there is a France to the North of the Mediterranean, and another France to the South, and that it is indispensable to maintain between these two portions of French territory permanent communication, both in peace and war. It results from that that it is necessary for our fleet to be so powerful that no one will attempt to dispute with us for the mastery of the sea between European and African France.

"This truth is so *banal* that I should have been almost ashamed to insist upon it, if the development given by Italy to her fleet had not attributed to it an importance of the first order, from the double point of view of the constitution and distribution of our naval forces.

"After having for some thirty years attached a very great importance to the development of her Navy, Italy appeared for a long period to have given up her projects, in order to give her full attention to the consolidation of her land forces. For ten years she seemed to have given up the idea of becoming a great naval Power.

"This is no longer the case to-day. Whether under pressure of counsel emanating from Berlin, or as the result of the rivalry between her interests and those of Austria in the Adriatic, or in order to carry out her ambitions in Tripoli, which have landed her in a war with Turkey, the Italian Government determined that the Peninsula should possess a powerful fleet. Dreadnoughts succeeded each other with rapidity on the Italian building slips, and the Italian squadrons became each year more powerful units.

"However that may be, we do not believe, and we do not wish to believe that the Italian fleet is intended to counteract our influence in the Western basin of the Mediterranean, in the part of that sea which separates the two Frances, of which I have spoken; we believe rather that the Italian fleet is constructed in view of the Eastern Mediterranean, where Italy has great economical and political interests. But the fidelity with which successive Italian Governments have adhered to the Triple Alliance obliges us to consider the eventuality of a conflict between the Triple Alliance and the Triple Entente. We should have, under those circumstances, to defend ourselves in the Western Mediterranean, not only against the Italian fleet, but also against the Austrian, which, on its side, is rapidly becoming of real importance.

"The consequence of this situation is that the greater part of the battleships which figured in our naval programme of 1910 must be stationed

in the Western Mediterranean, whilst our territorial waters and our Channel, Northern and Atlantic coasts will be abandoned almost defenceless to the attacks of the German fleet.

"In 1901, when at Toulon came the first official manifestation of a *rapprochement* between France and Italy, later still, when we gave our assent to an Italian conquest of Tripoli, we believed that as the result it would be possible for us to concentrate our squadrons *vis-à-vis* with those of Germany, that is to say, in the North. If our Government, if, in particular, those of our Ministers who worked to bring about the *rapprochement* with Italy, were under that illusion, they must recognize to-day that they deceived themselves.

"We have no right to reproach Italy, neither with her fidelity to the Germanic Alliance, nor with her ambitions in the Western Mediterranean—ambitions which we have ourselves favoured—nor the care with which she has developed her navy proportionately with the growth of her ambitions; but it is impossible to overlook the fact that her naval rivalry in the Mediterranean creates for us a difficult situation, because it imposes on us the inevitable necessity for doubling our naval programme without delay.

"If the Western Mediterranean will absorb almost all of the battleships of the 1910 programme, is it not evident that our Government will commit an extremely grave error if they do not at once take into consideration the drawing up a new programme, with the view of the protection of our Northern and Atlantic territorial waters against the German fleet?

"If our Government and seamen believe in the absolute necessity of maintaining in the Western Mediterranean all our armoured fleet in order to protect the coasts of Provence and Africa against the Italian and Austrian fleets, is it not also equally evident that a similar obligation is imposed on us in the North, where we are menaced by the German fleet, which is very superior to those of Austria and Italy, and of which the strength each day approaches nearer and nearer to that of England."

The Action.

UNITED STATES.

The Jubilee of the Turret: the "Monitor" and the "Merrimac."

Fifty years ago, on the 9th March, 1862, was fought in Hampton Roads the first naval action between armoured ships, when the U.S. turret-ship "Monitor"—the first of that type to be constructed in the U.S. or any other Navy—successfully checked the Confederate armoured ram "Merrimac" from completing the work she had commenced the previous day of destroying the Federal wooden warships lying in the Roads. It may be of interest to recall the details of this memorable action, which practically settled the type of the battleship of the future; and it may be noted that had the "Merrimac" been the victor, the whole course of the struggle between the North and the South might have been altered.

The Civil War broke out in the early part of 1861, and on the 21st April the Norfolk Navy Yard was abandoned by the Federals on the approach of the Confederates, the dockyard and ships undergoing repair at the yard being set on fire; among these latter being the 44-gun screw frigate "Merrimac," which, after burning to the water's edge, sank. On the 30th May she was floated by the Confederates, when the lower part of the hull and her engines were found to be undamaged. She was then placed in dry dock, and her upper works were razed to the level

of the old berth deck, which was three feet six inches above the light water-line. On this deck, for 170 feet amidships, bulwarks, consisting of 20 inches of pitch pine, covered with four inches of oak, and sloping at an angle of 35 degrees, were built, meeting the roof seven feet above the deck. Outside of this 24 inches of solid wood backing, rolled-iron plates, two inches thick and eight inches wide, were laid horizontally, and over this again were laid similar plates vertically, the four inches of iron being bolted through with 1½ inch iron bolts, which were secured on the inside. This shot-proof casemate was covered with a light grating, 20 feet wide and about 160 feet long, forming the promenade deck. Forward of the funnel was the pilot house, protected by the same thickness of iron as the sides. Forward and aft of this battery the vessel's hull was decked over so as to be awash in fighting trim, and attached to the bow, some two feet below water, was a cast-iron ram, projecting some distance beyond the stem. The battery was pierced for ten guns, the ends of the casemate being rounded so as to carry 7-inch rifled guns, which, being mounted on pivots, could be fired either abeam or on the keel line forward and aft. The broadside armament consisted of two rifled 6-inch guns, and six 9-inch smooth-bore Dahlgren guns, firing hollow shot or shell. The four rifled guns were heavily reinforced by 3-inch bands, shrunk round the breech.

The task of rebuilding the "Merrimac" was carried on under great difficulties, owing to the lack of skilled workmen, and the almost total destruction of the workshops in the yard by the retreating Federals. Work, however, was steadily pushed on, and when, towards the close of 1861, news came through the lines that a novel ironclad vessel was being built at New York, it stimulated the Confederates to redoubled efforts. But, in spite of their greatest exertions, it was not until March, 1862, that the ship was completed. She was placed under the command of Commodore Buchanan, a U.S. naval officer of distinction, who had thrown in his lot with the South, and he had with him a staff of officers, nearly all of whom had seceded with him. Her crew of 320 was largely made up of volunteers from the army at Richmond.

An hour before noon on the 8th March, the "Merrimac" cast loose from her moorings and steamed down the Elizabeth River. Up to the last moment she was crowded with workmen, and when she started not a gun had been worked, the crew had not been exercised even in their ordinary duties, the engines had not made a single revolution, the officers and men were all strangers to each other, while the ship herself was a bold experiment, which had not undergone the test even of a trial trip. From the first it was seen that the engines were unsatisfactory, as the ship could only make five knots at the best, while her great length and her 22-foot draught made it extremely difficult to manœuvre her in the narrow channels.

Off Sewell's Point, where the Elizabeth runs into the Hampton Roads, Buchanan headed the "Merrimac," which was accompanied by two small gunboats, down the roads towards Newport News Point, where lay the U.S. 50-gun sailing frigate "Congress," and the 24-gun corvette "Cumberland," both anchored in fancied security under the Federal batteries, which commanded all the water communications to Richmond by way of the James River. It was a matter of great importance to the Southern cause that these interruptions to their communications should be removed. Farther down the Roads, off Fort Monroe, were the sailing frigate "St. Lawrence," and the steam frigates "Roanoke" and "Minnesota."

It was a beautiful spring morning and everything was quiet on board the Federal ships; there had been so many rumours about the "Merrimac," that the Federal officers had become sceptical about her, when about noon the smoke of three steamers was noticed on board the Northern ships over the woodlands that concealed the Elizabeth River from the "Cumberland's" lookout. At last, what looked like the roof of a large barn, from a chimney in which smoke was belching forth, emerged from the river and came into full view. It was the "Merrimac" at last.

The shore batteries were manned, and the Federal ships quickly cleared for action, while the "Merrimac," with her ports closed, and well in advance of her two consorts, steered towards the "Congress" and "Cumberland," and by one o'clock was within long range. The "Cumberland" now opened fire, and was followed by the "Congress" and shore batteries, but the projectiles glanced harmlessly from the iron mail of the ironclad. About half past two, when within easy range, the "Merrimac" opened fire from her bow 7-inch rifled gun, the shot striking the "Cumberland's" quarter, killing and wounding many men, while the storm of projectiles from the broadsides of the Federal ships and the batteries glanced from the "Merrimac's" plating, with no more effect than so many pebbles. The "Merrimac" next rammed the "Cumberland," and that ship, after sustaining an unequal combat for over half an hour, and with a heavy loss in killed and wounded, sank at half past three; the "Merrimac" now turned her attention to the "Congress," which ship, after half her crew had been placed *hors de combat*, was forced to haul down her colours, and the "Merrimac," not being able to bring her out, she was set on fire and completely destroyed. While this destruction was going on, the other U.S. ships were unable to come to the assistance of their comrades, as they all three, after getting under weigh, grounded in the narrow channels, owing to the state of the tide.

Although the "Merrimac" had been the target for more than a hundred heavy guns, her casemate had not been materially injured; but everything exposed was swept away, while two of her broadside guns had been disabled by having their muzzles shot away. But beyond this, she was as formidable as ever, and anchoring for the night off Sewell's Point, she only awaited the return of daylight and tide to complete the destruction of the wooden vessels in the Roads.

The disastrous results of the day's fighting spread consternation over the North, and caused corresponding rejoicing in the South. High were the hopes of the "Merrimac's" people, as they rested that night and dreamed of easy victory on the morrow; little realizing that another still more novel vessel than their own was ready to step into the breach, and would ere the next sunset have changed the whole face of affairs. On the side of the Federals, the renewal of the fighting the next day was looked forward to with dread and anxiety, for it seemed as if nothing could save them from destruction, and like their triumphant enemies, little did they dream that the tide of victory was to be turned in their favour before many hours were over.

On the 4th October, 1861, four months after the raising of the "Merrimac," the U.S. Government contracted with Ericsson, an ex-Swedish artillery officer, settled at New York, for the construction of a war vessel of a completely new type. An iron-plated raft, 172 feet over all, 41 feet 6 inches beam, and 11 feet 4 inches depth of hold, with a revolving iron turret containing two 11-inch Dahlgren guns, were the striking

features of this novel craft. As less than two feet of the hull was to appear above water, the target surface was reduced to a minimum, and this surface was protected with five layers of iron plates, each one inch thick, while the deck had two layers of half-inch plates. The turret, 20 feet in diameter and nine feet high, was built of eight layers of one-inch iron plates, the roof being also protected by railroad iron, while the propeller and rudder were protected by the overhang of the deck. The pilot-house on deck forward was made of massive bars of iron, with a movable iron plate, an inch and a half thick, as a cover for the top. The keel was laid on the 25th October, 1861, and she was launched on the 30th January following, having been only a little over three months on the stocks; on the 19th February she went on her trial trip, and was handed over to the Government, although it was not until the 4th March that her guns were mounted.

At eleven o'clock on the morning of the 6th March, the "Monitor," although designed only for the smooth waters of harbours and rivers, put to sea in tow of a tug, and escorted by two other vessels; and after a stormy passage, during which she nearly foundered, on the morning of the 8th she got into smooth water again; at four in the afternoon, while passing Cape Henry, the distant booming of guns was heard, which proved to be the "Merrimac" completing the destruction of the "Congress." The "Monitor" cleared for action, and every exertion was made to reach the scene of action, but it was nine o'clock in the evening before she arrived off Fort Monroe, where she anchored alongside the "Minnesota," and all night long preparations for the impending conflict were made on board her.

At eight o'clock the "Merrimac" weighed and turned her head towards the "Minnesota," evidently with the intention of finishing her, and opened fire on her when within range. All eyes were now turned on the "Monitor," some with hope, some sceptically, and it was with a sense of relief that she was seen to move from her anchorage and boldly head for the enemy. The Confederates immediately recognized the new vessel as the "Monitor," one of the "Merrimac's" men thus describing her in a letter: "We soon descried a strange-looking iron tower sliding over the water towards us." The presence of the "Monitor" caused a change in the Confederate programme, which was to destroy the "Minnesota," "Roanoke," and "St. Lawrence," after which the way to Washington and New York would be open to her. Now, instead of proceeding directly for her original prey, the "Merrimac" turned towards the "Monitor," to settle once for all who should be the master of the Roads.

The two strange vessels approached each other in silence; on the one side the Federals awaited the issue with the deepest anxiety, while on the other the Confederates watched the approaching duel with confidence; but all felt that the result of the battle would tilt the scales of the Civil War heavily one way or the other. About 8.30 a.m., the "Merrimac" opened fire with her bow gun, but missed, while the "Monitor" reserved her fire until within short range, before she fired both her turret guns; at the same moment the "Merrimac" brought her starboard broadside to bear, and careful aim being taken, every shot struck her opponent's turret, but without effect, nor did the heavy projectiles from the "Monitor's" guns effect any damage against the armoured sides of the "Merrimac," although the Confederate crew realized the difference in the superior weight of the 11-inch shot and the lighter guns of the

frigates. After the action had lasted for some time, and the fire of the "Monitor" having no apparent result upon her antagonist, her commander made an attempt to ram, a dash being made at the "Merrimac's" stern in the hope of disabling her rudder or propeller, but the blow missed its mark by a few feet, so that the "Monitor" merely grazed along the "Merrimac's" quarter, but at this instant both her guns were discharged simultaneously, and the solid 11-inch projectiles striking close together half-way up the casemate crushed in the iron plates two or three inches. Another shot planted in the same place would have penetrated, but this could not be easily done, owing to the difficulties under which the guns' crews in the turret laboured, the machinery and turret itself having become so rusted during the bad weather experienced on the voyage from New York, and the want of practise in working it. The only view the men in the turret had of the outside world was over the muzzles of their guns, which cleared the ports by only a few inches, so they were only able to take flying shots while the turret was revolving.

After firing broadside after broadside at the "Monitor," but without damaging her, the "Merrimac" attempted to ram, but only succeeded in giving a slanting blow. Writing later of the battle, one of the crew of the "Merrimac" wrote: "After nearly two hours, and many shot and shell had been exchanged at close quarters, no perceptible damage was done to either side. The 'Merrimac' is discouragingly cumbrous and unwieldy. To turn her for each broadside fifteen minutes are lost, while during all this time the 'Monitor' is whirling round and round like a top, and the easy working of her turret and precise and rapid movements elicited the admiration of us all. She is evidently invulnerable to our shell, and when we tried to run her down, she is so flat and broad, she merely slides away from under our hull, as a floating plank would slip away from the cutwater of a barge."

At the end of two hours of steady fighting, the ammunition in the "Monitor's" turret began to fail, upon which, her commander hauled off to replenish his stock, which could only be done when the scuttle in the revolving deck of the turret was exactly over a corresponding opening in the stationary deck immediately below it, which compelled the ship to haul out of action. In fifteen minutes the battle was renewed, but finding that the "Monitor" was keeping in shoal water, the commander of the "Merrimac" determined to return to Norfolk, while the "Monitor" anchored again by the "Minnesota."

In this fight the "Monitor" was struck nine times on her turret, and 13 times on other parts of the vessel; the deepest indentation was made by a shot that entered four inches into the iron on her side. Ninety-seven indentations of shot were found on the "Merrimac," 20 of which were from the 11-inch guns of the "Monitor."

Much discussion arose as to whether either side could claim a victory in the battle of the 9th March. But this at least is certain, the "Merrimac," on that morning, came out with the avowed intention of destroying the remaining ships in Hampton Roads, knowing that the "Monitor" had arrived on the scene, and she retired in the evening without having accomplished her object. The "Monitor," on the other hand, entered Hampton Roads with the avowed purpose of preventing the destruction of the Federal ships, and this she accomplished. The ships never met each other in action again.

MILITARY NOTES.

BRITISH EMPIRE.

HOME.

TRAINING ARRANGEMENTS FOR REGULAR TROOPS IN 1912.

Aldershot Command.

1ST CAVALRY BRIGADE.—Brigade training, July 15th to August 10th, near Aldershot. Divisional training, September 9th to September 14th, near Royston. Army manœuvres, September 16th to September 19th.

1ST AND 2ND DIVISIONS.—Brigade training, July 1st to July 13th, near Aldershot. Divisional training, July 15th to August 10th, near Aldershot. Interdivisional manœuvres, September 9th to September 14th, in Norfolk, Cambridgeshire, and Suffolk. Army manœuvres, September 16th to September 19th. Inspection of 2nd Division by I.G.H.F., between 29th July and 3rd August.

BATTALION, MOUNTED INFANTRY (THREE COMPANIES).—Divisional training, September 9th to September 14th, near Royston. Army manœuvres, September 16th to September 19th. Forms part of Mounted Brigade.

Eastern Command.

4TH CAVALRY BRIGADE.—Brigade training, August 16th to August 31st, on Salisbury Plain. Divisional training, September 9th to September 14th, near Royston. Inspection of the 4th Cavalry Brigade by I.G.H.F., 28th to 31st August. Army manœuvres, September 16th to September 19th.

4TH DIVISION (10TH, 11TH, 12TH INFANTRY BRIGADES).—Brigade training, August 12th to August 24th, at Aldershot. Divisional training, August 26th to September 7th, at Aldershot. Inspection of 4th Division by I.G.H.F., between 9th and 14th September. Army manœuvres, September 16th to September 19th.

Southern Command.

2ND CAVALRY BRIGADE.—Brigade training, August 18th to August 31st, on Salisbury Plain. Divisional training, September 9th to September 14th, near Royston. Inspection of 2nd Cavalry Brigade by I.G.H.F., 28th to 31st August. Army manœuvres, September 16th to September 19th.

3RD DIVISION (7TH INFANTRY BRIGADE).—Brigade training, July 26th to August 3rd, near Salisbury Plain. Divisional training, September 2nd to September 14th, on Salisbury Plain. Army manœuvres, September 16th to September 19th.

3RD DIVISION (8TH AND 9TH INFANTRY BRIGADES).—Brigade training, August 19th to August 27th, on Salisbury Plain. Divisional training, September 2nd to September 14th. Army manœuvres, September 16th to September 19th.

London District.

COMPOSITE REGIMENT, HOUSEHOLD CAVALRY (forms part of Mounted Brigade).—Divisional training, September 9th to September 14th, near Royston. Army manœuvres, September 16th to September 19th.

4TH INFANTRY BRIGADE (FOOT GUARDS).—Brigade training, September 2nd to September 7th, near Swaffham (Norfolk). Interdivisional manœuvres, September 9th to September 14th, in Norfolk, Cambridgeshire, and Suffolk, with 2nd Division. Army manœuvres, September 16th to September 19th, with 2nd Division.

Irish Command.

3RD CAVALRY BRIGADE.—Brigade training, July 24th to August 17th, at the Curragh.

5TH DIVISION.—Brigade training: 13th Infantry Brigade, September 2nd to September 14th, at Coolmoney; 14th Infantry Brigade, September 2nd to September 14th, at Stradbally; 15th Infantry Brigade, September 2nd to September 14th, at Shillelagh. Divisional training, September 16th to September 21st, at the Curragh.

6TH DIVISION.—Brigade training: 16th Infantry Brigade, August 30th to September 10th, south-west of Fermoy; 17th Infantry Brigade, August 30th to September 10th, at Kilworth. Divisional training, September 11th to September 21st, near Kilworth.

Northern Command.

2ND DRAGOONS; ROYAL SCOTS GREYS (forms part of Mounted Brigade).—Divisional training, September 9th to September 14th, near Royston. Army manœuvres, September 16th to September 19th.

18TH INFANTRY BRIGADE.—Brigade training, August 6th to August 12th, in Wales.

Reconnaissance Scheme.

A reconnaissance scheme, in which the 1st Cavalry Brigade from Aldershot and the 2nd and 4th Cavalry Brigades from Salisbury Plain will be opposed by the Mounted Brigade, will take place from 2nd to 7th September.

Army Manœuvres.

Army manœuvres will take place from 16th to 19th September in the Manœuvre Area, comprising portions of the counties of Norfolk, Suffolk, Essex, Hertford, Huntingdon, Bedford, and Cambridge.

The following appointments have been announced:—

Red Force.—Lieut.-General Sir D. Haig, K.C.I.E., K.C.V.O., in command; Chief Umpire, Lieut.-General Sir B. M. Hamilton, K.C.B., K.C.V.O.

Blue Force.—Lieut.-General J. M. Grierson, K.C.B., in command; Chief Umpire, Lieut.-General Sir H. L. Smith-Dorrien, K.C.B., D.S.O., A.D.C.

CAVALRY BENEFIT ASSOCIATION.

This Association has been recently formed with the special object of providing office accommodation, secretarial and executive administration for those cavalry regiments whose benefit societies may wish to join the Association. Such regiments joining the Association will be entirely free to carry out under their own committee the mode of management and method of working their own Society or Association. The Committee of the Cavalry Benefit Association consists of one member elected from each regiment joining the Association, and should such representative be unable to attend any meeting of the committee, the said regiment may

delegate a substitute with full voting power. The Chairman is elected by the Committee and holds office for two years. The appointment of a secretary and the administrative staff rests with the Committee of the Cavalry Benefit Association with full powers to adopt such measures as may best fulfil the objects of the Association.

A regiment joining this Association pays an entrance fee of £10 as a contribution towards the office furniture and fittings, and yearly an equal share of the Association's annual expenses, which are estimated to not exceed £300. The following Regimental Benefit Associations have already joined the Cavalry Benefit Association: 4th Dragoon Guards, 9th Lancers, 11th Hussars, 12th Lancers, 13th Hussars, 18th Hussars.

For further particulars application should be made to the Secretary, Cavalry Benefit Association, 33 Tothill Street, Westminster, S.W.

Australia.

ORGANIZATION AND DISTRIBUTION.—The following is a short summary of the present organization and distribution of the Commonwealth Military Forces:—

Queensland provides the 1st Division; New South Wales the 2nd and 3rd Divisions, with two spare brigades; Victoria the 4th and 5th Divisions, and one spare brigade, which will complete the 6th Division in South Australia; Western Australia furnishes one and a half brigades, and Tasmania one brigade. Divisions, infantry brigades and light horse brigades will eventually be composed of the same number of units as are similar formations at home, the light horse brigade corresponding to the mounted brigade.

Battalions and brigades are numbered consecutively throughout the Commonwealth in the order given above.

New Zealand.

PROGRESS OF THE UNIVERSAL TRAINING.—The senior cadet training has commenced throughout the whole Dominion. The attendances at parades have averaged about 60 per cent., the balance being mainly absentees. It has been decided that the surplus of men available for universal training, who are not taken into the Territorial Force, shall be trained in the rifle clubs.

It is proposed to hold a camp of instruction in June for the new N.C.O.'s of the permanent staff, and subsequently in July to form an instructional squadron, an instructional battery, and an instructional battalion, composed of the officers of the N.Z. Staff Corps, the warrant and N.C.O.'s of the permanent staff, and the N.C.O.'s and men of the Permanent Force of Royal N.Z. Artillery. Territorial officers will be encouraged to join these units during their training, and avail themselves of the example and instruction which they will thereby get.

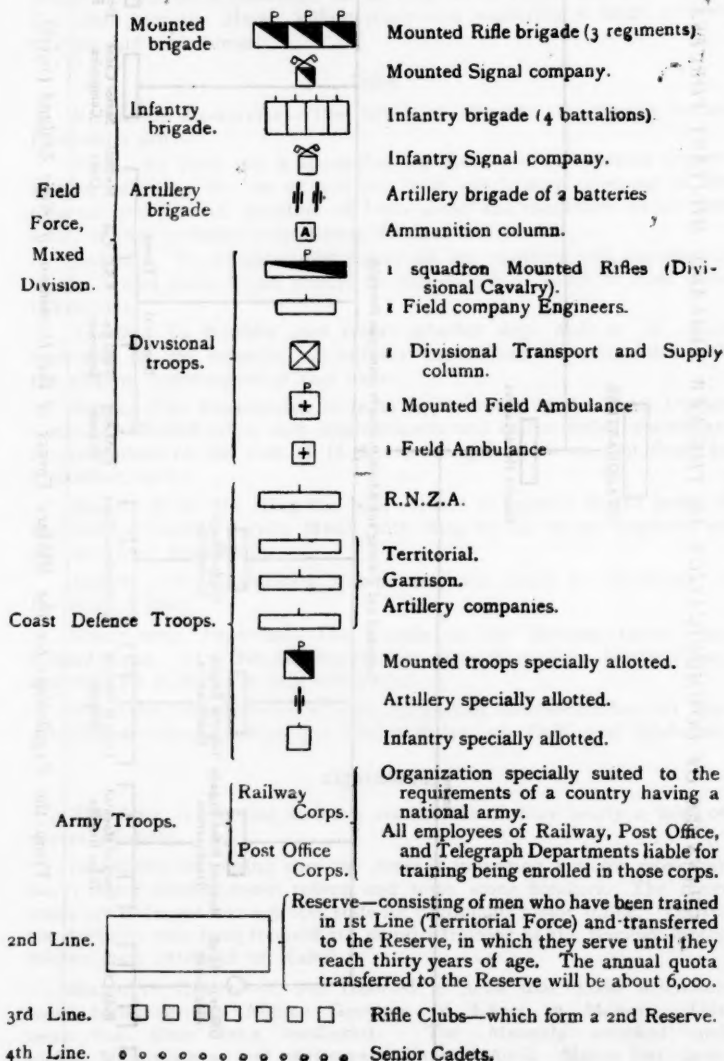
Five more cadets have been sent to the Royal Military College of Australia in addition to the ten cadets already training.

APPOINTMENTS.—Colonel A. W. Robin, C.B., C.M.G., New Zealand Staff Corps, has been selected to represent New Zealand on the Dominion section of the Imperial General Staff at the War Office.

Field Marshal Lord Roberts has accepted the honorary colonelcy of the Royal New Zealand Artillery and the New Zealand Field and

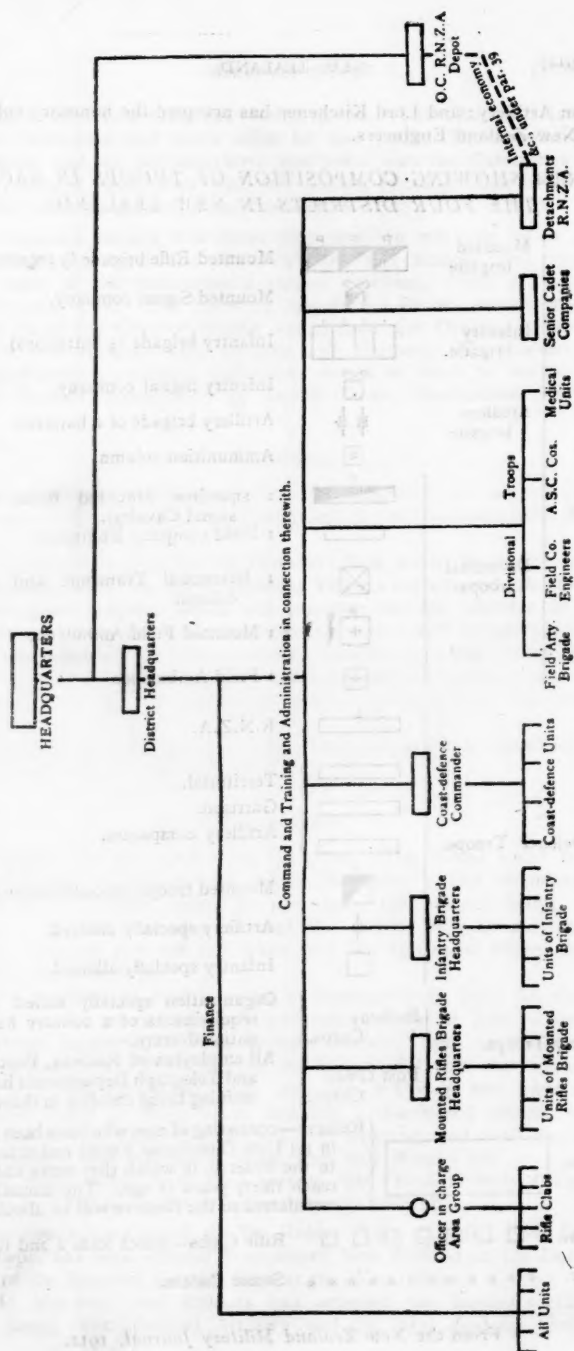
Garrison Artillery; and Lord Kitchener has accepted the honorary colonelcy of the New Zealand Engineers.

DIAGRAM SHOWING COMPOSITION OF TROOPS IN EACH OF THE FOUR DISTRICTS IN NEW ZEALAND.¹



¹ From the *New Zealand Military Journal*, 1912.

CHANNELS OF COMMUNICATION IN THE NEW ZEALAND MILITARY FORCES.¹



¹ From the Regulations for the Military Forces of the Dominion of New Zealand (1911).

Colonies and Protectorates.

SOMALILAND : ATTACK ON AIK.—A report has been received from Somaliland stating that Aik was attacked by a large Dervish force on May 7th, and that considerable loss was inflicted on the friendly tribesmen. When the Dervish ammunition failed, these tribes rallied and pursued the Dervishes into the Haud, killing many and capturing a large number of rifles and some horses.

India

NICHOLSON COMMITTEE.—The terms of reference to the Nicholson Committee are :—

First. To carry out a comprehensive survey of the various circumstances requiring the use of military force which may arise out of the external and internal situation of India under the conditions which now exist, or may probably arise during the next few years.

Secondly. To consider and report on the numbers and constitution of the armed force which should be maintained in India to meet these obligations.

Thirdly. To consider and report whether any, and, if so, what measures for the reduction of military expenditure are compatible with the efficient maintenance of that force.

NEPAL.—The Government of India is presenting to the Nepal Durbar 2,000 Lee-Metford rifles, with appurtenances and half a million cartridges, in recognition of the visit of H.M. the King-Emperor to that State in December, 1911.

ASSAM.—H.M. the King has been pleased to approve of the grant of the Indian General Service Medal with clasp to the troops employed on the late Abor Expedition.

BURMA.—The Hkamtilong column returned safely to Myitkyina at the end of April.

NORTH-WEST FRONTIER.—The trouble on the Mahsud border has quieted down. The Derajat brigade has returned to Dera Ismail Khan, and the 57th Rifles have been withdrawn.

WIRELESS TELEGRAPHY.—Wireless telegraphic communication has been established between Jutogh and Fort William, *via* Delhi and Allahabad.

Afghanistan.

The Amir is reported to have remitted to Turkey nearly a lakh of rupees (Kabuli).

In addition to touring cars the Amir is importing a motor passenger lorry, motor lorries, steam rollers and some stone breakers. The main roads are to be put into a proper state for continuous motor traffic. Thirty-six Afghans, who have received six months training at the Bombay Motor Works, have returned to Kabul.

ISING IN KHOST.—It was reported in April that 3,000 tribesmen were besieging the Afghan Governor of Khost in Matun. This news has since been confirmed. The Mangals attacked and sacked Matun bazaar and cantonments on 23rd April. Matun fort, however, appeared still to be holding out. The Amir has ordered a punitive force to be sent to Khost under Naib Sipah Salar Saiyid Shah Khan, and,

according to the Press, has declared a Holy War against the Mangal, Zadrán, and Jadrán tribes.

AUSTRIA-HUNGARY.

THE SOUTHERN SLAV QUESTION.—Side by side with the struggle of the Hungarian Parliament to shake themselves free from Imperial control, a succession of measures have been taken by Hungary to abrogate the rights and liberties of the Southern Slavs in Croatia. In March, the Croatian Diet, which contained an anti-Hungarian majority, was arbitrarily dissolved by the ban of Croatia, M. Cuvaj. On April 3rd, the Croatian constitution was forcibly suspended; M. Cuvaj was appointed Commissioner, with power to control the police, confiscate the Press, and proclaim martial law. He has published a decree ordering the arrest of all persons "who spread rumours directed against the present régime." Great sympathy is being shown in Serbia for the oppressed Croats. In Austria too, movements of protest against the establishment of a dictatorship in Croatia are rapidly gathering strength. In the Austrian Parliament, all the principal parties, Czechs, Croats, Germans, Slovenes, Poles and Serbs joined in unanimous condemnation of Hungarian action, and insisted that the Government should make every effort to bring so crying a scandal to an end. The Austrian Premier, Count Sturgkh, was expected to plead incompetence as to Hungarian affairs; but to the general surprise, made a firm though guarded speech, in which he stated that the measures taken in Croatia were prejudicial to the interests of the Empire, in that they created unrest among the Slav subjects of Austria, checked the absorption of the Slavs in Bosnia-Herzegovina, and endangered good relations with the Balkan States. He promised to take all measures which might be constitutionally possible for the restoration of Croatian liberties. Great indignation has been raised by this speech in the Hungarian Press. The Vienna Press recognize that "something like a volcanic tremor is now running through the Southern Slav world," and points out that what is taking place now at Agram, would not be possible at Belgrade, perhaps not even in Turkey. A significant demonstration took place at Belgrade on April 20th, when 150 Croatian students were welcomed as guests by the Serbian students, thousands of spectators assisting in the demonstration. The entire crowd finally pressed to the Palace. The King, on appearing at the balcony, was greeted with loud shouts of "Hail to the King of the Southern Slavs,"

At the time of writing there is no alteration in the situation in Croatia. The Croatian constitution remains suspended, and all manifestations of public discontent with the prevailing absolutism are being rigorously suppressed. The attitude of Hungary both to Croatia and to the Army Bill has roused considerable bitterness in Austria. This feeling has found expression in the Austrian Parliament, and its endorsement by the Austrian Premier, Count Sturgkh, has given rise to considerable resentment in Hungary.

Count Sturgkh is now said to be suffering from a sudden illness, and his duties have been temporarily entrusted to the Minister of the Interior.

BOSNIA-HERZEGOVINA.—The hands of the military Governor-General of Bosnia-Herzegovina have been considerably strengthened by a change in the system of Government. Formerly, the Governor, who is Inspector-General and direct Commander of the military forces, controlled the civil administration through an official known as the "Civil Adlatus." This latter post has now been abolished, and the control of civil matters is placed directly under the Governor-General.

CADET SCHOOLS.—The Austrian Landwehr Cadet School at Vienna has been abolished. In its place a new Franz Joseph Military Academy has been instituted, with an affiliated new Oberrealschule. The new academy will be on the same lines as the Theresa Academy, and will supply officers to the infantry and cavalry of the *Landwehr* and Common Army, primarily the former.

DRUMMERS IN THE HONVED.—Drummers are to be abolished in the *Honved*, their places being taken by two trumpeters per company. This reform has been already partially carried out in the Austrian *Landwehr* and will, in time, be applied also to the "Common Army." In the armed forces as a whole, 256 battalions have trumpeters, and 424 have drummers.

BELGIUM.

ARMY REFORM.—Since the resignation of the War Minister, General Hellebaut, a series of decrees have been passed, introducing reforms into the Army. The following are the most important:—

- (a) The mobilization and military operations department are in future to be under the Chief of the General Staff instead of the War Minister.
- (b) A Committee of National Defence has been created, which must sit once a quarter. It consists of six members of the War Minister's Council, the four divisional commanders, the governors of Antwerp, Liège and Namur, and the commandant of the Gendarmerie.
- (c) A War Minister's Council is instituted, including the Chief of the General Staff, one cavalry and one infantry General, and the Inspectors-General of artillery and engineers.
- (d) Officers are not to remain for more than five years at the War Office.
- (e) The pay of officers has been raised.

FRANCE.

ARMY MANŒUVRES.—Army manœuvres will be directed by the Chief of the General Staff. Each side will consist of one cavalry division and two corps d'armée, while a reserve division of 18 battalions remains unallotted, and will be employed as the Director may decide.

REORGANIZATION OF THE GENERAL STAFF.—M. Millerand has carried out a further reform in the organization of the General Staff at the French War Office.

The Chief of the General Staff, until this reform was made, had immediately under him three *sous chefs*, each one of whom was at the head of a group of bureaux. The first *sous chef* was a *Général de Division*, the other two were *Généraux de Brigade*.

On the outbreak of war the Chief of the General Staff left the War Office to take command of the principal group of armies, and took with him the first *sous chef* as his chief Staff officer. This plan left the Minister of War with no General of high rank to help him. Moreover, in time of peace, the duty of co-ordinating the work of the second and third groups of bureaux was found to be more than the Chief of the General Staff could get through.

In order to get over these two difficulties the appointments of the second and third *sous chefs* have been abolished, and the second and

third groups of bureaux have been put under one *sous chef*, who, like the first *sous chef*, will be a *Général de Division*, and will be eligible for rank as Commander of a Corps d'Armée, and also as a member of the *Conseil supérieur de la guerre*. This second *sous chef* will take a great deal of detail work off the shoulders of the Chief of the General Staff in peace, and when war is declared he will carry on the necessary work at the War Office, taking under his wing those members of the first bureau who still remain in Paris, and will always be at the elbow of the War Minister as his official military adviser.

M. Millerand has been warmly congratulated by the Press on his latest reform.

CONFIDENTIAL REPORTS.—A circular has been issued which does away with the obligation to show to officers, who are not well reported on, the remarks of their superiors. It was found that the system of communicating these reports to the officers concerned, resulted in all reports becoming uniform and colourless, and by thus cutting the wings of criticism, the Minister found himself without any of the positive information which was indispensable.

"ADJUDANTS-CHEFS."—A new grade has been created, that of *Adjudant Chef*, with a higher rate of pay than that of *Adjudant*, which gives to *sous officiers* a better future than they at present have a prospect of enjoying. The *Adjudant Chef* will have the command of an officer in the field, but will not lose the various advantages which have to be sacrificed by *sous officiers* who become officers.

TRIALS OF NEW UNIFORM.—Monsieur Détaille has designed two new sets of uniform, which are to be tried by a battalion of the Paris garrison. One set consists of a complete set of garments of a greenish grey colour. The other consists of a blue grey capote and vareuse, red trousers, blue putties and a red and blue kepi with a leather top.

PLAIN CLOTHES.—A decree has been signed by the President to the following effect: When off duty officers are allowed to wear plain clothes. Adjutants and married sous-officers may wear plain clothes on Sundays and on *jours fériés*. Special leave can be given to other non-commissioned officers for special objects, but only in very exceptional cases to private soldiers. At the same time a ministerial circular urges that the privilege granted by the decree should be used sparingly. A temporary permission to the above effect was granted for one year in March, 1911, as a trial which has presumably been successful.

ARTILLERY TRIALS.—During March, experiments with star shells took place at Bourges, and, according to the Press, the results were most satisfactory. Trials of a new horse artillery and anti-balloon guns were made at the same time.

TELEGRAPH REGIMENTS.—It is proposed to form a telegraph regiment of 13 companies, of which one will be allotted to wireless work. The regiment will also contain a group of telegraphists for fortresses, and a company of drivers.

It is also proposed to form three companies for North Africa, of which one will be for wireless work, and also one group for the North African regular system.

DÉCLASSEMENT OF FORTRESSES.—A law has been approved sanctioning the "déclassement" of the following forts:—

Pagny La Blanche Côte, south of Toul; Bourlemont, west of Neu-chatel; Hirson; Curgies, near Valenciennes; Maulde and Flines, on frontier between Valenciennes and Tournai; Conde-Sur-Aisne; Citadel and actual town of Laon; actual town and its immediate surroundings of La Fère.

NEW CUIRASS.—Trials are being made of a new cuirass of a non-metallic material which, while weighing only seven lbs. instead of 15 lbs. as does the old steel one, will resist sword strokes and revolver bullets, and will not glitter.

VISUAL SIGNALLING.—New regulations for the establishment of visual signalling have been published. Part I. deals with lamps and heliographs. Part II. has not yet been issued.

PUNISHMENTS.—The power of awarding punishments has been restored to the lower ranks from lieutenants to corporals inclusive, but in order to avoid an abuse of this power by corporals, punishments awarded by them have to be confirmed by an officer.

Colonies and Protectorates.

COLONIAL BUDGET.—The Colonial Budget amounts to £4,198,600, an increase of £62,300 on the Budget of 1912. The greater part of this increase is due to the intended creation of six new companies of "Tirailleurs Sénégalais."

ALGERIA.—In the province of Oran some little disturbance has been caused amongst the natives owing to the introduction of compulsory service, but in other parts the new law is working smoothly.

FRENCH WEST AFRICA.—Senegal is being required to find a considerable number of troops. It has been decided to establish another Senegalese battalion in Algeria, and three more in Morocco, thus bringing the number of black troops in these countries to two and six battalions respectively. The new units are being formed at Dakar. In order to provide for the relief of the numerous Senegalese troops serving outside the Colony, a reserve brigade of 5,000 men is being constituted.

The principle of conscription has been introduced with certain restrictions which ensure a year's residence in their own country to men who have spent a long period away before they can be again sent on foreign service.

EQUATORIAL AFRICA has been divided into four military commands as follows:—Gabon, Middle Congo, Ubangi-Shari, and the Chad Territory. The military headquarters of the Colony are at Brazzaville.

Marocco.

REORGANIZATION OF THE SHEREEFIAN ARMY.—The following measures for the reorganization of the Sherreefian Army have been drawn up by the French War Minister.

The French military mission to Marocco is dissolved, the personnel and matériel being transferred to the new organization. The Sherreefian Army is placed under the command of a French General or Colonel, who will himself be under the orders of the General Officer Commanding-in-Chief of the Army of Occupation.

The army as reorganized is to include:—

- (a) Staff and departmental services.
- (b) A Shereefian guard which will form the permanent garrison of Fez, and will be composed of two infantry battalions, two squadrons of cavalry and one mountain battery.
- (c) Moroccan Army, consisting of the following units:—nine infantry battalions (each composed of four companies of four sections each, a group of mounted scouts, and pack transport); five cavalry squadrons, each of four troops; four mountain batteries (each of three sections, one ammunition section and a "park arsenal"); one engineer battalion of two companies; one telegraph detachment; one train company; two detachments of administrative troops (for Fez and Tangier respectively); one mobile ambulance column; one military hospital; one military prison.

The term of service will normally be for four years, in exceptional cases men may be enlisted for one, two, or three years. Service is to be compulsory, substitution being allowed. Tribes will have obligatory service imposed on them gradually, as their administrative organization is developed. Volunteers are permitted to enlist up to January 1st, 1913.

Companies, squadrons and artillery batteries and sections will be commanded by French Officers; half companies, troops, and single guns by French non-commissioned officers. In addition to the officers of the French military mission, 35 officers and 126 non-commissioned officers have been selected for service in the Moroccan Army.

The expenditure on this new organization from March to December 31st, 1912, is estimated at £640,000.

GENERAL SITUATION.—There has been rather less actual fighting in May than in April, but the general situation has certainly not improved. The unrest and anti-French feeling has increased; certain of the tribes, especially in the south, have sunk their common differences in order to unite against the French. The punitive measures consequent on the Fez revolt have not had the desired effect, and the city itself was attacked in force on the 25th and 26th May.

On the other hand, the Sultan has not yet abdicated, and has postponed his proposed journey to Rabat. General Lyautey has arrived at Fez, which should strengthen the French position there. Reinforcements to the extent of about 4,000 men have arrived at Casablanca, which will raise the total number of French troops in the country to about 47,000 men.

MILITARY OPERATIONS: (a) *Near Mekinez.*—On May 2nd the Zemmour and Zaer tribes attacked a French reconnoitring force near Mekinez (south-west of Fez). The French, who numbered 500, successfully repulsed the attack; their losses were seven killed, four missing, and 30 wounded.

(b) *On the Algerian Frontier.*—In this portion of the theatre of operations, the French are effectively occupying the quadrilateral Taourirt—Debdou—Merada*—Fritissa,* which lies to the south of the Oudja—Taza—Fez road. They have a mobile force of about 4,000 men at Fritissa. There has been constant skirmishing with the Beni Warain in this locality during the whole month, the tribesmen having made several attacks on the transport park at Merada. The French have successfully repulsed all the Moorish attacks, and their

* Not on map.

Infantry, 651 battalions; Cavalry, 516 squadrons; Field and Horse Artillery, 633 batteries; Foot Artillery, 49 battalions; Pioneers, 33 battalions; Communication Troops, 18 battalions; Train, 25 battalions.

IMPERIAL MANŒUVRES, 1912.—It is stated that 24 cavalry regiments, exclusive of the five divisional regiments, will take part in the Imperial Manœuvres this year.

WIRELESS STATION AT COLOGNE.—The most powerful station belonging to the military authorities has just been completed on the military manœuvring ground north of Cologne.

German Colonies.

PROTECTORATE TROOPS BILL.—This Bill came up for its first reading on 27th February. Although it deals with the Protectorate Troops in all the German Colonies it is based on the requirements of German South-West Africa, and aims at the creation of a reserve force in the various colonies.

GERMAN S.W. AFRICA: RAILWAYS.—The North-South railway from Karibib to Keetmanshoop is reported to have been opened for public traffic.

GERMAN EAST AFRICA: RAILWAYS.—Railhead of the Central Railway reached Tabora on the 26th February; this section was not due to be completed before the 1st July, 1914, but the work has been pushed on as it is feared that the Belgian line to Lake Tanganyika (to be ready in 1914) will obtain a monopoly of the Lake trade unless the German line arrives there first. Tabora is 256 miles from Lake Tanganyika.

PROPOSED WIRELESS STATION.—It is proposed to instal a wireless telegraphy station in Dar-es-salaam with a range of 600 miles, which will be able to communicate with towns on the shores of Victoria Nyanza.

CAMEROONS: WIRELESS TELEGRAPHY.—A wireless telegraph station was opened in Duala on the 5th March. The radius of action is stated to be about 680 miles.

MEXICO.

The revolution in Mexico continues. The followers of Zapata, an old chief of President Madero, give trouble south of the capital; and Orozco, one of Madero's Generals in the last revolution, is fighting in the north at the head of an army against his former chief. The Government are raising a loan of £2,000,000, with a view to increasing the army to 60,000 men, and so making peace in the Republic. More mounted troops are required. Considerable anxiety is felt in Mexico City as regards the safety and property of foreign residents, and intervention, either by the United States or of an international kind is being asked for.

It was reported in the Press of the 16th April, that the Government at Washington had notified the Mexican Government that the United States would hold both the Government and people of Mexico responsible for "all wanton or irregular acts, sacrificing or endangering American life or destroying American property or interests." This communication has caused considerable annoyance to the Mexican Government, especially as a similar communication was sent to General Orozco, the revolutionary leader, who is held to be answerable to the Mexican courts alone for his offences.

The latest news as regards fighting is that 5,000 rebels under Orozco were defeated on the 13th May near Torreon by Federal troops under General Huerta, and Orozco retreated northwards to Conejos after losing ten guns. Zapata, with 3,000 rebels was engaged on the 21st May, 15 miles south of Mexico City, with a force of 1,200 Federals.

OTTOMAN EMPIRE.

POLITICAL.—There are no signs at present of any change in the present Government, though Nail Bey, the Finance Minister, is said to have resigned. In regard to external relations, the somewhat insistent notes of Russia relating to the closure of the Dardanelles, and certain passages in M. Sazonoff's speech in the Duma, have created an unfavourable impression in Turkey, and have accentuated the hostile feeling caused by the action of Russia in the Caucasus and Persia.

The rather sudden transfer of Baron Marshall von Bieberstein from his post of German Ambassador at Constantinople has been the subject of widespread comment in the European Press. It was under the Baron's tenure of office that the many measures, tending to the advancement of German interests in the Ottoman Empire of late years, were inaugurated, and his transfer to London may be regarded as a step of first-rate importance in the political sphere.

SUPPLY OF RECRUITS.—Mahmoud Shevket Pasha, in a speech before the Senate on the 21st May, urged the necessity of passing in full the Recruiting Law which has now been three years before Parliament. It has already been suspected that the Ottoman Government would find it difficult to obtain sufficient yearly contingents of recruits to maintain a peace strength of 300,000 men, the numbers aimed at, and therefore the following remarks by Mahmoud Shevket in the course of his speech are significant: "Our population is not sufficient to supply the number of soldiers necessary for the needs of the Empire;" and again, speaking of the inclusion of the Christian element, "These (*i.e.*, the Christian recruits) showed at first a keenness to serve, but their zeal has weakened, and many have fled the country in order to avoid military service." Even, therefore, when the law is passed in its entirety, it is probable that the Ottoman Army, though more efficient, will not, numerically speaking, be greatly augmented.

ARMY ORGANIZATION.—The four first-class Redif divisions of the IInd Inspection in Europe have now been broken up, and the 13 second-class divisions will, henceforward, be composed of both first- and second-class men. The headquarters of two of the latter divisions have been changed from Berat and Gilan to Scutari (Albania) and Mitrovitza respectively.

TROOPS IN LOWER SYRIA.—The battalions of the Beirut division, stationed at Beirut, Jaffa, and Beersheba, were raised to a strength of 1,000 men in March last. The battalions from Jerusalem have been ordered to Medina.

SUPPLY OF HORSES.—It is reported that the sale of horses for Turkey has been prohibited in the Caucasus, and that several dealers who had proceeded to Kars for the purpose of buying horses have returned empty handed.

If this prohibition is maintained or extended, it may cause some considerable embarrassment to the Turkish military authorities, who mainly depend on Russian importations for the supply of artillery horses.

RELATIONS WITH BULGARIA.—A skirmish between Turkish and Bulgarian frontier guards, in which one of each nationality was killed, has occurred near Kurutepe.

The Turks have hitherto refused to allow the construction of a line from Kumanovo to the Bulgarian frontier, or of any alternative line, which would link up the Bulgarian and Macedonian railway systems. A Turkish railway commission has now visited Sofia, and according to Press reports, a satisfactory agreement has been reached.

CRETE.—The Deputies, stopped by the war vessels from proceeding to Athens, are still detained on board, and no decision had, at the end of May, been come to as to their final disposal. The Cretan Revolutionary Government continue to adopt an attitude calculated to defy the Protecting Powers, and threats on the part of the latter seem to have no effect.

ALBANIA.—Disturbances are threatened in this locality for the third year in succession; indeed certain isolated attacks on bodies of troops have already commenced. It is hoped that the unrest may be localized, as was the case to a great extent last spring, but the Ottoman authorities have already adopted precautionary measures.

It is announced that the 1st Division (consisting of ten battalions) from Constantinople is being despatched to Albania; while, within the area of the VIIth (Uskub) Army Corps, reinforcements have already been sent to Mitrovitza and to Ferisovich. Troops are also reported to have left Salonica.

RAILWAYS AND FINANCE.—An option for a loan of £T10,000,000 has been arranged with the Ottoman Bank; if it is taken up, seven millions will be devoted to covering the last Budget deficit, and three millions will be set apart for the construction of the Samsun—Sivas railway line, and its extensions. It is proposed to allocate this line to the French Régie Générale, but it remains to be seen how, in virtue of the Black Sea Basin Agreement of 1900, this will be viewed by Russia.

Work has begun on the Decauville light line from Sorovich (on the Monastir—Salonica railway) to Serfije, thence to the Greek frontier.

RUMANIA.

ARMY ESTIMATES.—The Army Estimates for 1912 have been published, and amount to 74,428,036 francs, an increase of about 5,150,000 francs, as compared with those of 1911. This increase is chiefly caused by:—(a) Additions to the pay and numbers of re-engaged non-commissioned officers; (b) Replenishment of reserve stores; (c) Increase in the number, and improvement in the quality of remounts; (d) Building and repair of barracks.

ARTILLERY.—A portion of the fifteen 10.5 cm. howitzer batteries ordered from Messrs. Krupp are reported to be due for delivery on October 1st, on which date five batteries will be formed. The date of arrival of four 7.5 cm. mountain batteries, which were reported to have been ordered from Schneider Creusot, is not known.

FIELD KITCHENS.—A field kitchen, made by Manfred Weiss & Co., has been taken into use by the military department.

RUSSIA.

DEATH OF LIEUT.-GENERAL GERNGROS.—Lieut.-General Gerngros, who was Chief of the General Staff from September, 1909, to February, 1911,

and has since then commanded the VIIth Army Corps, died at Yalta on the 17th May.

VISIT OF THE WAR MINISTER TO TURKESTAN.—During the month of April, General Sukhomlinov made a tour in Russian Turkestan, and visited, amongst other places, Samarkand, Tashkent, Merv, and Kushk. At the latter place a whole day was allotted to an inspection of the defences.

NEW REGULATIONS.—The following publications have been recently notified :—

Gunnery rules for batteries (light, horse and mountain) armed with the 3-in. Q.F. gun, 1911. Gunnery rules for batteries armed with the 4.8-in. howitzer (1909 pattern), 1911. Gun drill for land-fortress artillery, 1911. Cavalry drill, 1912. Machine-gun regulations, 1912. (Part II. "Description of material parts," only has so far appeared, but Parts I., III. and IV. will follow shortly). Regulations for Field Artillery in Battle; 1912.

MECHANICAL TRANSPORT.—The War Department has decided to provide the Staff of each military district and Army Corps, with one motor car, and to train the drivers with the Instructional Automobile Company, and in certain railway companies.

COURTS OF HONOUR.—Russian Army Order 81 introduces new regulations for the military tribunals, formerly known as "Courts of the Society of Officers," which are now renamed "Courts of Honour." An officer must now have a certain amount of qualifying service before he can be selected as a member of one of these Courts. The jurisdiction of the Courts has been considerably widened, and now includes company and field officers belonging to units (exclusive of the Commanding Officer), and Staff and Departmental Officers of corresponding status. These Courts may be assembled to investigate cases of alleged behaviour unbecoming to an officer, or quarrels between individual officers. In the former case, the Court may acquit the accused, or reprimand him, or recommend his dismissal from the service. In the latter case, the Court may reconcile the disputants, or order a duel, or refer the matter to the convening authority.

RAILWAYS.—The assignments for the Amur railway for 1912 amount to £6,628,000. The date for completion now estimated is 1916. The Council of Ministers has decided to postpone work on the construction of the Black Sea Coast Railway until it has before it the results of a detailed survey of the proposed Trans-Caucasus railway. The contract for the Volga-Bugulma railway bridge at Simbirsk has been given out. This bridge will be 2,100 yards long, and will cost £1,000,000. The railway bridge on the Odessa—Bachmach railway over the Dnyepyr, near Cherkasi, has been completed.

SWEDEN.

AMMUNITION.—It is reported in the Press that a new type of small-arm ammunition is under trial in Sweden. It consists of a pointed bullet with a slow burning powder, which gives an increased muzzle velocity of nearly 100 metres per second over the existing ammunition.

INSPECTIONS.—An Army Order directs that inspections must not be made so as to interfere with the regular course of training, but must take the form of close observation of the work in progress, and criticism on the deficiencies or irregularities noticed.

LANDSTORM.—Training courses will be held in future in each divisional district, at least once in four years, for officers and non-commissioned officers of the Landstorm. Other ranks will be exercised periodically as funds permit.

RIFLE CLUBS.—The membership of the voluntary rifle clubs at the end of 1911 amounted to 161,000; 137,009 were active members, nearly 90 per cent. of whom had fired at least 50 rounds during the year.

SWITZERLAND.

RELATIONS WITH ITALY.—The somewhat provocative attitude of the Italian irredentist Press, with regard to Switzerland, appears to have caused some uneasiness in military circles, and several Swiss newspapers have published polemical articles on the subject of fortifications on the southern frontier, strategical railways in North Italy, the inadvisability of tunnelling the Splügen Pass, and other vexed questions in connection with Italy. Whether justified or not, considerable suspicion of Italian projects in the future, appears to exist in Switzerland.

ORGANIZATION OF THE GENERAL STAFF.—A Decree, fixing the establishment and organization of the General Staff of the Army has been published. The General Staff is divided into five departments, viz. :—General Staff, Adjutant-General's, Engineer, Medical and Commissariat Departments. There are 73 officers in all so employed.

UNITED STATES.

PHILIPPINE ISLANDS.—A general order has been published forming permanent regiments of maximum strength in the Philippines. The eight regiments of infantry and four of cavalry now quartered there are to be replaced by four permanent infantry and two permanent cavalry regiments.

The tour of duty of officers will be three years, and recruits will in future be made into large drafts and sent at fixed intervals. This change is to take place on 1st July, 1912.

PANAMA CANAL ZONE.—A notice has been recently issued in the Canal Zone announcing that in future no one except United States officers in uniform will be allowed to approach or enter any of the proposed sites of the fortifications of the Canal.

AERONAUTICAL NOTES.

BRITISH EMPIRE.

FLIGHTS BY NAVAL AIRMEN.—See page 844

ROYAL FLYING CORPS.

The following are the chief points of the orders recently issued on the composition of the Military Wing :—

Officers : Officers of all branches may apply to join the Corps; regular officers must have not less than two years' service. For the present officers may be posted to the reserve till a vacancy occurs at the Central Flying School, but ultimately, entry to the Corps as officers will be confined to officers or *civilians* who have passed the School.

A civilian who has a Royal Aero Club certificate, will, if selected for the Military Wing, be commissioned as a second lieutenant on probation in the Special Reserve of Officers, and may be confirmed in his rank on completion of the course at the School, and will then be graded in the Royal Flying Corps as flying officer. Officers selected for the Corps who have obtained, or subsequently obtain a Royal Aero Club certificate

at their own expense receive £75; civilians granted commissions may obtain this sum under similar conditions.

The grades and rates of pay in the corps are: (1) Commanding officer (lieut.-colonel) £800 a year; (2) squadron commander (major) 25s. a day; (3) flight commander (captain) 17s. a day; (4) flying officer 12s. a day. The ranks in brackets are granted temporarily to officers of lower rank holding these appointments. (2), (3), and (4) receive flying pay at 8s. a day, which is issued continuously to those in aeroplane squadrons, or qualified flyers in the dirigible squadron; those in the latter squadron not so qualified receive flying pay only on days on which they ascend in a dirigible or kite. Officers while under instruction at the flying school receive regimental emoluments and 4s. a day flying pay.

Officers not serving continuously in the Royal Flying Corps will form the reserve. They will be divided into a First Reserve, who must fly during each quarter of the year, and a Second Reserve, who need not fly, but who will be available for service in the Royal Flying Corps in war.

Warrant Officers, N.C.O.'s and Men.—Warrant officers and N.C.O.'s for the Military Wing will be obtained either by transfer (on probation for six months) from the Regular Army or by enlistment; in the latter case the terms will be four years' colour and four years' reserve service.

The daily rates of pay, in addition to allowances for lodging, messing, etc., for men enlisting in or transferring to the Military Wing, will be:—

Warrant officer 9s., sergeant 6s., first-class air mechanic 4s., second-class air mechanic 2s. Those selected to be trained as aeroplane flyers will receive 1s. a day flying pay in addition while undergoing a course at the Central Flying School; candidates who attain the required standard at the end of the course will be entitled to 4s. or 2s. a day flying pay, according to their proficiency; retention of flying pay will depend on passing a satisfactory test every half year. Those serving in the Airship and Kite Squadron will, unless they are qualified aeroplane flyers, receive flying pay at the rate of 2s. a day, only for days on which they ascend in an airship or kite.

Organization.—The organization of the Military Wing to fulfil the requirements of the Expeditionary Force will eventually be as follows:—

- a. Wing headquarters.
- b. Seven aeroplane squadrons each providing 12 aeroplanes.
- c. One airship and kite squadron providing two airships and two flights of kites.
- d. One line of communications Royal Flying Corps workshops.

The peace establishment of an aeroplane squadron will be:—

Detail.	Officers.	Warrant officers and sergeants	Rank and file.		Total.
			Air Mech- anics	Others	
Headquarters (excluding attached)	7	2	12	—	21
Headquarters attached	—	—	—	3	3
Three flights	12	21	96	—	129
Total squadron (excluding attached)	19	23	108	—	150
Total squadron (including attached)	19	23	108	3	153

The transport consists of seven motor cars, 19 motor lorries, six trailer trucks, and six motor bicycles.

The Central Flying School will be on Salisbury Plain, and will have an establishment of a Commandant, 11 other officers, and 54 other ranks, besides 20 mechanics and labourers. Its functions will be to train candidates and personnel of the Royal Flying Corps in the art of flying; principles of mechanics and aeronautics; maintenance and use of instruments, internal combustion engines; meteorology; observation; air navigation, and flying by compass; photography from air craft; signalling as applied to aircraft; types of warships and aircraft of all nations. There will probably be three courses each year.

The Royal Aircraft Factory will carry out the higher training of mechanics, repairs and construction; tests with British and foreign engines on aeroplanes; experimental work; manufacture of hydrogen, and generally meeting requirements of the Airship and Kite Squadron.

BULGARIA.

AVIATION.—The War Department has ordered several aeroplanes in France, including Voisin monoplanes and Bristol and Wright biplanes. Ten officers and several non-commissioned officers are being sent to France for instruction in flying. The Government intend voting a sum of £12,000 for the purchase of additional aeroplanes; this amount will appear as extraordinary expenditure and is not included in the Military Estimates.

CHINA.

MILITARY AERONAUTICS.—On the 13th and 14th April successful flights were made by a young Chinese officer, Z. Y. Lee, on an Etrich monoplane at Shanghai. The members of the Military Government were present. Lee has received his training in Austria, and has recently returned to China with two Etrich monoplanes. A second Chinese officer is still in Austria waiting to take delivery of more monoplanes of the same make, destined for the Chinese Army.

FRANCE.

MILITARY AERONAUTICS.—General Roques, Permanent Inspector of Military Aeronautics, has been appointed to command the 7th Infantry Division, and his place is taken by Colonel Hirschauer, lately second in command to General Roques. Colonel Hirschauer will shortly be promoted to the rank of General in all probability.

RATES OF PAY.—Special rates of pay have now been authorized for the Aeronautique Militaire. Officers who are breveté receive a special indemnity of ten francs a day.

AEROPLANES.—Lieutenant de Briez on a Deperdussin Monoplane flew 438 miles in eight-and-a-half hours.

In April the aviator Busson, on a Deperdussin Gnome, made a good flight from Pau to St. Cyr in competition for the Pommery Cup. This month was marked by several bad accidents, and a circular has been issued by the War Minister emphasizing the necessity of taking no unnecessary risks and of lessening the number of accidents.

Trials for the Michelin prize were carried out at Chalons by two competitors. One competitor on a *biplace* bi-plane flying at a height of 200 metres dropped 15 bombs in 30 minutes. Two of these bombs hit

the target and the bulk of the remainder only missed it by a few yards. The target is a white circular sheet spread out on the ground 20 metres in diameter. The second competitor on a *monoplace* monoplane was not nearly so successful, he could not lift all his bombs and the double rôle of pilot and bomb dropper was too much for him. He was further handicapped by not being able to see where his bombs fell.

"STABILISATEUR."—A committee called the "Union pour la sécurité en aéroplane" is stimulating efforts to find an efficient "stabilisateur," and hopes soon to be able to offer a prize of £20,000 to any successful inventor.

DIRIGIBLES.—The height record formerly held by the "Adjudant Reau," which ascended to 2,150 metres in December last, has been beaten by the "Clement Bayard III.," which attained an altitude of 2,900 metres (11,570 feet) while carrying six persons. "Le Capitaine Ferber" made a fine voyage from Paris to Toul (300 kilometres).

In the schools for training observers it has been found that observation becomes too easy after a few experiences on ground that is well known, and instructions have been issued to take observing officers, who are being trained, to localities that they do not know and where troops are working.

WIRELESS TELEGRAPHY.—On May 6th experiments were carried out to test the possibility of using wireless telegraphy from aeroplanes. A biplane was used, and messages were sent and received for a distance of 30 miles.

GERMANY.

THE NATIONAL AVIATION FUND.—Up till May 11th more than £100,000 had been subscribed by the public to the national aviation fund.

PRIZES FOR AIRCRAFT MOTORS.—The conditions for the Emperor's prize of £2,500 for the best German motor for aircraft, in the competition commencing on October 1st at Allersdorf, are:—The motor must have been completely manufactured in German workshops; h.p. must be not less than 50 and not more than 115; weight must not be more than 13 lbs. per h.p.

UPPER RHINE RELIABILITY MEETING.—This competition took place during May, commencing on the 12th, and although it opened in a rather disappointing way—only two competitors succeeding in accomplishing the first stage—some good flying was seen in the subsequent stages. The results of the meeting seem to establish the fact that at present the German motors are not exceptionally reliable.

LARGE GOVERNMENT SUBSIDY.—Before the adjournment of the Reichstag last month, the estimates for the support of the recently founded "German Experimental Institute for Aeronautics" were passed. These provide for £10,000 as a contribution towards the founding of the Institute, and £2,500 towards its maintenance during 1912.

THE SIEMENS-SCHUCKERT.—This dirigible, which apparently has been taken over by the military authorities, met with a slight accident when landing after carrying out some trial flights on May 2nd. The airship landed among some trees, lost three propellers and broke one of its rudders.

WIRELESS COMMUNICATION BETWEEN DIRIGIBLES.—Considerable importance is attached to the success of certain experiments carried out in

wireless communications between two dirigibles taking part in a military reconnaissance, held during the Upper Rhine reliability meeting near Metz, referred to above. Communication was successfully established, not only with the more important wireless stations on the western frontier, but also between the two airships themselves.

OTTOMAN EMPIRE.

AVIATION.—The new flying ground is to be now located at San Stefano. Six officers and five mechanics have left to study in France. One of the four monoplanes ordered from France has arrived at Constantinople, and carried out some trials. Some officers will possibly be sent to England to study aviation in the Bristol School.

RUSSIA.

MILITARY AERONAUTICS.—The Council of Ministers has decided that the General Staff, instead of the Engineer Directorate, shall exercise control over military aviation. Russian Army Order 605/1911 authorizes the inclusion of the Siberian Air Battalion at Vladivostok in the 1st Siberian Army Corps. Thirty-five engineer officers have been detailed to join the Officers' Aeronautical School for the instructional course.

NIEUPORT AEROPLANES.—It is reported in the Press that the War Department has decided to adopt the Nieuport aeroplane, and that further orders for Farman and Bleriot machines will be stopped. The Nieuport aeroplane is extensively used at the Sevastopol school of aviation.

It is reported that the War Department competition for aeroplanes has been postponed till the autumn.

NAVAL AERONAUTICS.—The "Society for strengthening the Fleet," etc., is arranging to train aeroplane detachments to take part in the Army manoeuvres. Three detachments, each of 12 flyers, using Farman, Blériot, and Nieuport aeroplanes respectively, will be formed.

It is reported in the German Press that the Russian Admiralty has decided to equip the Baltic squadron with Farman-Curtis aeroplanes.

SERVIA.

AVIATION.—A monoplane designed and constructed by M. Mercep, of Agram, has been purchased by the Servian Government. The total weight, including the 50-H.P. air-cooled motor, is 300 kilograms; the area is 20 square metres, the length and breadth nine and ten metres, respectively.

Three Servian officers have been sent to France to study aviation. On their return public trials of machines suitable for purchase for army purposes will be held.

SPAIN.

AEROPLANES.—Two Bristol machines have been bought and are at Carabanchel, near Madrid. Three Nieuport monoplanes have also arrived there, but have not yet been unpacked for want of shed accommodation.

NOTICES OF BOOKS.

The Military Danger of Home Rule for Ireland. By Major-General Sir Thomas Fraser, K.C.B., C.M.G. With Map. London. John Murray, Albemarle Street. 1912.

There have been days not so very far past when religion was the dominant factor in politics, even among the most civilized nations of Europe, when the question whether a Catholic or Protestant Prince was to succeed to a vacant throne, or whether a Mediterranean island fortress should hoist the banner of the Crescent or of the Cross absorbed the attention and engaged the energies of her statesmen and soldiers. A German Lutheran would side with Sweden or Denmark against his own Emperor; a French Huguenot would be found serving under the British flag, and a Catholic Irishman under the fleur-de-lys. That stage has been passed, and nationality has now taken the place of religion as the compelling force: the struggle for life is no longer between Protestant and Catholic, but between Czech and German in Bohemia, between Pole and Prussian in Posen; the Danes in Schleswig look to Copenhagen, the Sclavs in Austria-Hungary to St. Petersburg as their political centre. In the question of Home Rule for Ireland both of these chief causes of human conflict are combined, for the cleavage of religious belief follows the line of cleavage of race. The question is, whether the Anglo-Saxon or the Celt is to be master in Ireland? The latter claims the supremacy on the ground of numbers, and of hereditary attachment to the soil: the former by virtue of long possession and of mental and moral superiority. And both claims are well grounded. Sir Thomas Fraser has no difficulty in answering the question, though, as he himself admits that he belongs to one of the parties to the quarrel, his verdict cannot be accepted as an impartial one. He clearly shows that the result of the passing of the present Home Rule Bill will be the subjection of a stronger race to a weaker one—a complete reversal of the natural law of the survival of the fittest. Irishmen have never accomplished anything great unless they were led by Englishmen. The Butlers, Desmonds, and Fitzgeralds, who led the native Irish for centuries, and were *Hibernis ipsis Hiberniores* were Normans who went over with Strongbow. Sarsfield was an Englishman; Parnell was an Englishman. Sir Thomas Fraser pertinently asks, "Why, where the weaker type is always striving to become the stronger, should we, in these small islands, set to work to drift down from the stronger to the weaker one, and one that by the law of its being, tends to disruption, particularly at times of national weakness or difficulty, as the teachings of many centuries of Irish history have stamped on our memories." And he proceeds to show how the maxim 'England's difficulty is Ireland's opportunity,' has inspired Nationalist councils in the past: "the experience of the past—in the traditions of which I was brought up—are the only sure guide to the serious probabilities of the future." Accordingly five out of the seven chapters of the book are devoted to a retrospect of Anglo-Irish history, describing the armed conflicts between the two races, the successive futile risings of the native Irish against the Anglo-Saxon invaders and immigrants, and the equally futile attempts at foreign intervention by Spanish and French expeditions. These enterprises were at first undertaken under the cloak of religious zeal or of dynastic ambition, with the hope and intention of striking a deadly blow at the power of England. Ireland had twice almost

succeeded in freeing herself from the Saxon yoke, and was twice re-conquered, the first time by Cromwell, the second time by William the Third. The fourth chapter, which is much the longest of the five, treats of the attempts of the French Revolutionary Government to invade Ireland, which more than once came perilously near to succeeding. But the French commanders were haunted by the fear of the British Navy, and the Directory evidently considered Irish support to be a broken reed to lean upon; moreover, atheistical France was looked on askance by the Catholic hierarchy in Ireland. Sir Thomas Fraser says, "The rebellion of 1798 showed that while religious animosities were as virulent as ever, the religious motive among the Catholics was much weaker than the Nationalism to which it was harnessed. We see that a sectional Parliament with complete legislative independence could not prevent rebellion." It could not prevent it, it rather provoked it. Sir Thomas calls the Irish Parliaments "Home Rule Parliaments," but they really represented only the Protestant and Anglo-Saxon minority in the country, and their power and authority rested entirely on the English connection.

Napoleon looked upon Ireland as he looked upon Poland, as a pawn in the ambitious game that he was playing, and after the destruction of his fleet at Trafalgar, he troubled himself no more about the existence of the Irish. Sir Thomas Fraser says, "It is noticeable that the old Irish families that retired to France in 1691 did not figure in the Revolutionary efforts to invade Ireland in 1796-98." The Irish were loyalist and Catholic to the backbone, and had no sympathy with the Revolution which dissolved the famous Irish Brigade that had served the French Crown so long and so gallantly: and many of its members ended their military career in the ranks of the British Army, transferring their untarnished loyalty to the service of their hereditary foe. In the fifth chapter the author treats of the story of Ireland in the nineteenth century, but he has here no military events to record, for the risings of the patriots under Smith O'Brien in 1848 and of the Fenian Brotherhood in 1867 were easily disposed of by the police. In the sixth chapter he draws the moral from the facts that he has related in the previous chapters, and argues conclusively that Home Rule is only a step towards complete separation, and that the task of re-conquering Ireland may perforce have to be undertaken by England once more. Commenting on the hypothesis that the British Navy can always be counted upon to overawe Ireland and to prevent its occupation by a hostile Power, he reminds Englishmen that the British Navy did not always hold undisputed command of the seas, that throughout the seventeenth and eighteenth centuries our superiority was contested by French and Dutch, and that it was not till after Trafalgar that Britannia became undisputed mistress of the seas. He goes on to say, "A century after 1809-10 our relative naval strength as compared with that of other Naval Powers was certainly not a tenth of what it was then; and the total of the annual financial resources of all those other Naval Powers is at least six times as great as ours. Consequently the prospects of our retaining even our present position, a position inferior to that of a two-Power standard, is more than doubtful, and the hypothesis falls to the ground."

"Seeing therefore that we no longer have the sea supremacy of the past, and are comparatively much weaker in army strength than we were a century ago, it would seem nothing short of madness to deprive ourselves, with our relatively small population, and one destined to decrease with our coal supply, of the security the union has been proved to give us; even if offered, 'the shadow of supremacy for the substance of control.'"

The arguments set forth in this book are an amplification of the contents of the letter by General Sir T. Fraser on the "Military Effects of Home Rule in Ireland," which appeared in the *Morning Post* some two years ago, when rumours of an intended Home Rule Bill were in the air. The text of this letter is appended to the seventh and last chapter of the book, in which the author returns to the political aspect of the question, and illustrates the dangers and defects of Home Rule, and draws a parallel between the proposed abandonment of Imperial rule in Ireland and the abandonment of Imperial Sovereignty over the Orange River Territory in 1854, which sovereignty it was found necessary to re-impose in 1900, our own day, at a great expense of blood and treasure. After analysing the forces at work to back up the demand for Irish Home Rule, Sir Thomas sums up the situation in the following pregnant words: "It is into this whirlpool of hostile forces we are called upon to thrust our fellow Protestants and other fellow Unionists to sink or swim as best they can, in order to buy off the undying hostility of a number of conspirators in Ireland and the United States, who direct us to do so at our peril, in order to enable them to wreck the Empire against which they have for long directed their attacks all the world over." The book is furnished with a good map of Ireland, and another of the United Kingdom, showing the distances between French, English and Irish ports, and a comprehensive table of contents and index.—F.H.T.

Garibaldi and the Making of Italy. By George Macaulay Trevelyan, late Fellow of Trinity College, Cambridge, author of "England in the Age of Wycliffe," &c., &c. With four maps and numerous illustrations. Longmans, Green & Co., 39, Paternoster Row, London, New York, Bombay, and Calcutta. 1911.

This volume is the third of a series in which Mr. Trevelyan has recently given us the history of the struggle of the Italian people for freedom and national unity, the previous ones being entitled "Garibaldi and the Defence of the Roman Republic," and "Garibaldi and the Thousand." The three books might fittingly be numbered as three volumes of the same work under the title of "Garibaldi and the Italian Risorgimento" or Resurrection, for they constitute a connected story of the revival of the body politic of Italy, of which Mazzini was the soul, Cavour the brain, and Garibaldi the right arm.

The author has rightly made the latter the hero of his stirring story. Guiseppe Garibaldi was among the greatest men and truest heroes that our age has produced, as noble in his aims, as pure in his life, and as unselfish in his character as George Washington or Charles Gordon. Mr. Trevelyan's last book narrated how he started secretly from Genoa on the 10th March, 1860, on a filibustering expedition to seize the island of Sicily, with one thousand comrades armed for the most part with old smoothbore muskets, and how by courage and audacity, and by his talents as a partisan leader, aided by the sympathy of the inhabitants, he made himself master of Palermo, and of the greater part of the island.

The Bourbon Government of the two Sicilies was no doubt a bad one, but the Sicilians were always "agin the Government," irrespective of its merits and it is not at all certain that they would not be equally ready to rise against the Government of to-day if an equally favourable opportunity presented itself. The opposition offered to the invaders by the Neapolitan Army was contemptible; Marshal Clary, with fifteen thousand regular soldiers, held the citadel of Messina, and allowed the Garibaldians

to enter and occupy the town without firing a shot. It is difficult to ascribe such conduct to anything but treachery; yet the Marshal was undoubtedly loyal to the King, and was indeed a violent reactionary. He professed that he was unable to rely upon his men; and no doubt there were many officers and soldiers in the Royal Army who secretly sympathized with the patriots, but pusillanimity seems to have had a larger share than treachery in reducing the Neapolitan Army of 100,000 men to almost absolute impotence. And the action of its leaders was paralyzed by the example of the King, Francis the Second, who, on the first news of the early successes of Garibaldi, granted his people the constitution which he had formerly denied to them, and substituted the tricolour for his white Bourbon flag.

His portrait appears in, but certainly does not adorn this book; "*le dernier expression de l'épuisement d'une race.*" Even an army of lions would have achieved little under a leader as timid as a deer; and the Neapolitans were no lions. Murat had failed to make them into good soldiers; and where he had failed no one else was likely to succeed. The four old Swiss regiments which had saved the Bourbon Crown and suppressed the revolution at Naples in 1848 had been recalled by the cantons from the Neapolitan service in 1859, the very year before Garibaldi's invasion of Sicily, public opinion in Switzerland no longer tolerating the employment of Swiss citizens to maintain a foreign despotism. Some of their officers and men volunteered to remain in the service of King Francis, and they formed the best part of two battalions at the battle of the Volturno, where they drove back the Garibaldians opposed to them. Old General Filangieri, who had learned the art of war under Murat, and had served the Bourbons faithfully for forty years, now washed his hands of the Royal cause, and took to his bed pretending indisposition. The fire-eating Bosco was the only one of the Royal Generals who showed any appetite for fighting, but his capacity was not equal to his courage, and he got badly beaten by Garibaldi at Milazzo.

The timorous King, his incompetent Generals, and their mutinous soldiers were on one side, and on the other the thousand ragged "red-shirts," animated by a fervent spirit of patriotism or by a fanatical love of liberty, and absolutely devoted to a gifted and trusted leader. And never was leader more worthy of the trust and confidence reposed in him by his followers. Garibaldi's talents were as varied as his habits were simple. The words applied by Sir Walter Scott to the hero of Acre, Sir Sydney Smith, might with justice apply to Garibaldi:

"Alike to him the sea, the shore,

The brand, the bridle, and the oar."

He climbed to the masthead of a steamer to reconnoitre the battle-field of Milazzo. During the battle he killed a captain of Neapolitan Dragoons with his sabre in single combat. After the victory he amused himself and his companions by capturing General Bosco's loose horses with a lasso, in the use of which he had become expert during his South American adventures. When one of the steamers which was to convey his bands across the Straits of Messina sprung a leak, and the hole could not be found, Garibaldi came to the rescue and himself located and stopped the leak. "That he should cause 15,000 soldiers of tyranny to lay down their arms seemed to him no more than an inevitable fate, now that Italy's hour had struck; but to find and calk a hole in a ship which had baffled the other seamen was an action of which a man had good right to be proud."

The crew and captain of the Scottish cattle steamer "City of Aberdeen," which had brought some of the volunteers from Genoa, "were passionately devoted to his cause and person." Mr. Trevelyan's pages abound with instances of the enthusiasm of the redshirts for their leader, of which the following example may here suffice:

"At Barcellona the principal church was employed as a hospital for Medi's wounded. As Garibaldi passed through the town the noise of his reception in the streets penetrated into the quiet of that gloomy hall, where a gigantic crucifix looked down upon the sufferers. In an instant they were struggling off their couches, and crawling to the door on hands and knees. As they lay crowded on the steps of the church he waved a gentle salutation and thanks to them and passed on towards Meri. One young Lombard who had been shot through the lungs crawled to his bed again, fell back on it, and died."

The original number of 1,000 volunteers with which Garibaldi landed at Marsala was rapidly augmented by the arrival of fresh bands from Northern Italy and by the enrolment of recruits in Sicily. At the battle of Milazzo, he had some 5,000 men against an equal number of royalists; at the Volturno, his army mustered about 20,000; and by the close of the brief campaign he had 50,000 men under his orders. The organization was irregular; the bands, which were called battalions, varied in strength from as high as 1,000 to as low as 300. The Englishman, Peard, who went by the name of "Garibaldi's Englishman," commanded a company of only thirty men who were armed with Colt's revolving rifles. These weapons did not give satisfaction to their users; they were difficult to load, and there was often an escape of fire from the breech, which scorched the hands and faces of the men.

Peard afterwards became Colonel of the British Legion, which was raised by Garibaldian agents in the United Kingdom; about 600 men were recruited for it and transported to Naples, but when they arrived the war was almost over, and little fighting remained to be done. They made a triumphal entry into Naples, and a brave show in their red tunics with the nosegays which were showered upon them by the crowd, stuck into the muzzles of their rifles.

Another Englishman named Dunne, who had served in the Turkish contingent during the Crimean War, commanded what was called the "English Regiment" of Sicilian volunteers, because there were several English officers in it besides the Colonel. It was armed with Enfield rifles supplied by English sympathisers, but the soldiers did not understand the sights, and might as well have been armed with smooth bores.

There was also a French company among the Garibaldini, and there was a foreign battalion commanded by one Wolff, which was chiefly composed of German and Swiss deserters from the Neapolitan service. Two hundred Hungarians who joined Garibaldi in Naples formed a corps of Light Cavalry, and the Field Artillery was supplied by guns captured from time to time from the enemy.

There are great discrepancies in the numbers of the combatants and the casualties on both sides in the engagements in this campaign as given in the various accounts, official and private; and Mr. Trevelyan has been at great pains to arrive at reliable conclusions on these points, devoting several appendices to examinations of the conflicting evidence, and reasons for his final decision. But it is of little use to tell us that the right wing of the Royal Neapolitan Army at the Volturno comprised "five regiments and eight battalions of infantry, eight regiments of cavalry and

dragoons, and seven batteries of artillery," when we do not know the number of battalions and squadrons in a regiment, nor the number of guns in a battery. . . A military author would have reckoned the strength by battalions, squadrons, and guns.

The victorious progress of Garibaldi in the Kingdom of Naples brought about the invasion of the Papal States by the Piedmontese and the destruction of the Pope's newly formed army of Catholic Crusaders. Pio Nono had been violently angered by Napoleon the Third's alliance with the Italian Liberals in 1859, to drive the Austrians out of Lombardy, and disregarding the wise counsels of Cardinal Antonelli, he put himself into the hands of the fanatical Monsignor de Mérode, whom he made his War Minister and entrusted with the task of raising an army which could render him independent of French support. "The Emperor will meet with his Waterloo, like his uncle" they said, "and then everything will be put back on its old footing, as it was before in 1815." The priests in all the catholic countries of Europe were turned into recruiting agents, and an army of some 15,000 men was collected and organized. The regiment of Papal Zouaves was largely composed of French Royalists and Legitimists bitterly hostile to the Empire. The rest of the corps was made up of Belgians. The Irish recruits only mustered some hundreds, but there were thousands of Swiss, Bavarians, and Austrians, as well as Italian subjects of the Pope.

The command was given to the French exile General Lamoricière, a relative of de Mérode's, and a bitter enemy of Louis Napoleon. The Papal Zouaves insulted the French Imperial troops in garrison at Rome and sang Royalist songs under their barrack windows. But when the thirty thousand Piedmontese troops suddenly crossed the Papal frontier, Pio Nono reverted to the counsels of Antonelli, and called on the French Emperor for aid, but in vain. That "halter between two opinions" was once more in a Liberal mood and deaf to the persuasions of his Empress and her priests. The Piedmontese pressed on. Their assault on the old castle of Spoleto was repulsed by the valour of Major O'Reilly and his hundred Irishmen, who formed part of the garrison. But when the old fort was knocked into ruins by the Piedmontese guns, "the Swiss and Italian Papalists compelled Major O'Reilly and the boys to open the gates."

Commenting on the strange fatality which had brought peasants from Munster and Connaught to shed their blood in defence of an ancient tyranny in the Marches of Umbria, the author observes,

"Thus does religious bigotry everywhere defeat its own ends: Cromwell had planted the Pope's power firm and broad in Ireland, but Gregory XVI. and Pio Nono had destroyed it in Italy."

When Lamoricière learned that the Piedmontese had crossed the frontier he made a dash at the head of seven thousand men for the strong fortress of Ancona, which was already occupied by five thousand of his soldiers. But General Cialdini with fifteen thousand men made forced marches and succeeded in barring his path. The Frenchman made a gallant attempt to cut his way through, and the decisive battle of Castelfidardo resulted in a complete victory for the Piedmontese, and the total destruction of the Papal army. Lamoricière escaped to Ancona with only 45 horsemen. All of his army who were not killed, wounded, or made prisoners on the field, disbanded themselves and returned to their homes, or sought shelter in the Virgin's House at Loreto, where they had in vain sought her favour on the eve of the lost battle. There on the next day they laid down their arms to the conquerors.

Ancona was besieged by sea and land, and the siege was pressed with such vigour that in a week Lamoricière and the garrison of five thousand men surrendered as prisoners of war. The surrender was precipitated by the explosion of the powder magazine, ignited by a shell from the Piedmontese war vessels. An Irish battalion of three hundred men signalized itself among the defenders by conspicuous courage in the many sharp encounters that took place during the progress of the siege.

The victorious Piedmontese hurried on into Naples, where Garibaldi's advance had been checked by the strong fortresses of Gaeta and Capua, and he had been obliged to stand on the defensive at Volturno. King Victor Emanuel met Garibaldi; the latter made over all his conquests to the former and the Royal Piedmontese Army took up the task of the Garibaldini, and put the finishing touch to the making of Italy.

We regret that the limits of our space prevent us from making more extracts from this fascinating book. Mr. Trevelyan's account of military operations is clear and masterly, and his style plain and vigorous; and he has gathered much information from sources not usually accessible. For instance, the private correspondence of the Russell family which has been placed at his disposal throws a flood of light on dark and tortuous passages of European diplomacy at a time when the French upstart Emperor had assumed the rôle of arbiter of the destinies of Europe, and imagined himself to be the controlling power in Continental politics, while he was being fooled by much cleverer men than himself, Cavour in Italy, and Bismarck in Germany. He thought that he was using them as his tools while he was really as clay in their hands. Cavour kept all the Courts of Europe in complete ignorance of his real aims and intentions. Few politicians in any country believed in the possibility of Italian unity. Louis Napoleon had driven the Austrians from Lombardy hoping to repeat the policy of his uncle and to substitute French for Austrian influence in Italy. Nothing was farther from his thoughts and intentions than the transformation of the Italian people into a self-contained and independent nation. Austria was sulky after her defeat at Solferino and was handicapped by the latent disaffection of Hungary. Cavour kept Kossuth in reserve like a card up his sleeve, ready to play it if Austria should take a hand in the game. In England the Tories still held the old doctrine that liberty was good only for the Anglo-Saxon race, and that other nations were best off under a benevolent despotism; the Whigs were more liberal minded; in the Cabinet, Palmerston, Gladstone, and Lord John Russell were warm friends of the Italian cause; the other Ministers were luke-warm. Mr. Trevelyan speaks of the conspiracy between Cavour and King Victor Emanuel; but there was only one conspirator; the King was a bluff, honest soldier who implicitly obeyed the Machiavellian instructions of his astute adviser. He wrote a letter to Garibaldi ordering him to desist from attacking the Kingdom of Naples; he then wrote a private letter telling him to go on and conquer, and he enclosed in it a draft of the reply which Garibaldi was to send to the first or public letter, saying that he most deeply regretted having to disobey his Majesty's commands, but that the call of duty, the cause of Italy, etc., etc. The King's aide-de-camp brought both these letters and the draft answer to Garibaldi at Palermo. Garibaldi read the official letter first; then he opened the private one and naturally burst out laughing. He copied the draft of the answer he was to make to the King, and the aide-de-camp returned with it to Turin. The letters were published, and the world generally was deceived. Lord John Russell "in his English

simplicity," says Mr. Trevelyan, "supposed that Victor Emanuel and Cavour meant what they said," and he was on the point of agreeing to the French Emperor's proposal for a joint demonstration of the French and British fleets to prevent Garibaldi crossing the Straits of Messina. By a lucky chance Cavour heard what was in the wind, and sent a private friend to let Lord John Russell know the real state of the case. The friend arrived at the house at the moment when Lord John was closeted with the French Ambassador. The intervention of Lady Russell had to be invoked to draw him out of his study when he was told the truth.

He returned to his study and dismissed the French Ambassador with a refusal. This was followed by the famous dispatch of October 27th, 1860, in which it was stated that "Her Majesty's Government must admit that the Italians themselves are the best judges of their own interests." Cavour's trusted agent Villamarina, said, "the dispatch was worth an army of 100,000 men." The book concludes with an account of Garibaldi's visit to England and his last days at Caprera. It contains three full page portraits of him, with those of many of his favourite companions, and others of celebrities of the time, and photographic views of the scenes of the campaign, sketches reproduced from the *Illustrated London News*, and cartoons from *Punch*. There are a dozen appendices containing Present States and Casualty Rolls of the Forces on both sides, diplomatic dispatches, correspondence, etc. And the book is furnished with good maps and plans, and a copious index.—F.H.T.

IMPORTANT NAVAL LITERATURE.

[A selected list of books added to the Admiralty Library during May, 1912, supplied by courtesy of the Admiralty Librarian.]

THE STRUCTURE OF THE ATMOSPHERE IN CLEAR WEATHER. A study of soundings with pilot balloons. By C. J. P. Cave. 4to. Cambridge, 1912.

REMINISCENCES OF A BLACKWALL MIDSHIPMAN. By W. I. Downie. 8vo. London, 1912.

A VOYAGE TO THE ARCTIC IN THE WHALER "AURORA." By David Moore Lindsay. 8vo. London, 1911.

CENTRIFUGAL PUMPS: THEIR DESIGN AND CONSTRUCTION. By Louis C. Loewenstein and Clarence P. Crissey. 8vo. London, 1911.

THE LIFE BOAT AND ITS STORY. By Noel T. Methley. 8vo. London, 1912.

A CALENDAR OF THE COURT MINUTES, ETC., OF THE EAST INDIA COMPANY. By Ethel Bruce Sainsbury. With an introduction and notes by William Foster. 1635-1649. Three vols. 8vo. Oxford, 1907-1912.

HOW TO GO TO SEA IN THE MERCHANT SERVICE. By Frederick H. Stafford. 8vo. Glasgow 1912.

SOME THINGS WE HAVE REMEMBERED. Samuel Thornton, Admiral, 1797-1859. Percy Melville Thornton, 1841-1911. By Percy Melville Thornton. 8vo. London, 1912.

THE RISE AND PROGRESS OF LIVERPOOL, FROM 1551 TO 1835. By James Touzeau. Two vols. 8vo. Liverpool, 1910.

MAROKKO-HELGOLAND. By Admiral z. D. Valois. 8vo. Berlin, n.d.

SHIPS, SEA SONGS AND CHANTIES. Collected by W. B. Whall, Master Mariner. The songs harmonized by R. H. Whall. Illustrated by Veronica Whall. 2nd edition, enlarged. 8vo. Glasgow, 1912.

GREAT WAS THE FALL. By a Naval Officer. 8vo. London, 1912.

A LINK OF EMPIRE, OR 70 YEARS OF BRITISH SHIPPING. Souvenir of the 70th year of incorporation of the Royal Mail Steam Packet Company. 4to. n.p. n.d.

NEUVIÈME CONGRÈS INTERNATIONAL DE GÉOGRAPHIE. Genève, 27 Juillet-6 Août, 1908. Compte rendu des travaux du Congrès, publié au nom du comité d'organisation par Arthur de Claparède. Three vols. 8vo. Genève, 1909-1911.

WIRELESS TELEGRAPHY STATIONS OF THE WORLD, including shore stations, merchant vessels, revenue cutters, and vessels of the United States Navy. Corrected to January 1st, 1912. 8vo. Washington, 1912.

SCOTTISH NATIONAL ANTARCTIC EXPEDITION. Report on the scientific results of the voyage of the S.Y. "Scotia," during the years 1902, 1903, and 1904, under the leadership of William S. Bruce. Vol. iii. Botany. Folio. Edinburgh, 1912.

THE HISTORY AND LIFE OF ROBERT BLAKE, ESQ., OF BRIDGEWATER, General and Admiral of the Fleets and Naval Forces of England. Containing a full account of his glorious achievements by sea and land, more especially by sea; where he obtained many surprising victories over Dutch, French, Spaniards, and others, Turks as well as Christians. To which is added, A Sketch of a Comparison between the Two Great Actions against the Spaniards at Santa Cruz and Porto Bello. Written by a gentleman bred in his family. 12mo. London, n.d.

A SOLEMN APPEAL TO THE PUBLIC, FROM AN INJURED OFFICER, Captain Baillie, late Lieutenant Governor of the Royal Hospital for Seamen at Greenwich; arising out of a series of authentic proceedings in the Court of King's-Bench on six prosecutions against him, for publishing certain libels (as it was alleged) in a printed book, intitled *The Case and Memorial of Greenwich Hospital*, addressed to the General Governors, in behalf of disabled seamen, widows, and children; and the evidence given on the subsequent enquiry at the Bar of the House of Lords, in consequence of the several prosecutions being discharged with costs. Folio. London, 1779.

MEMOIRES DE MONSIEUR DU GUAY-THOUIN, Lieut.-Général des Armées Navales, Commandeur de l'Ordre Royal & Militaire de S. Louis. 12mo. Amsterdam, 1756.

AN AUTHENTIC ACCOUNT OF THE LATE EXPEDITION TO BRETAGNE, conducted by Richard Lestock, Esq., Admiral of the Blue, and Lieut.-General St. Clair, Commander-in-Chief of the Land Forces. 8vo. London, 1747.

FOREIGN PERIODICALS.

NAVAL.

AUSTRIA-HUNGARY.

MITTEILUNGEN AUS DEM GEBIETE DES SEEWESENS. Pola: No. III., 1912.—The tides at Ragusa. The reform of the Italian Naval Academy. The German Naval Budget. Experiments with watertube boilers. The new United States battleships of the Nevada type. Aeronautical notes. The organization of the French flotillas. The Turkish Naval Budget. The British Flying Corps.

FRANCE.

LA MARINE FRANCAISE. Paris: May, 1912.—Not yet received. (NOTE: The contents given last month were those of the April, not, as stated, of the March number).

REVUE MARITIME. Paris: April, 1912.—Not yet received.

LA VIE MARITIME. Paris: 10th May, 1912.—Calibres greater than 30-cm. The cost of Dreadnoughts. Notes on boilers. The "Kangaroo" (vessel for transporting submarines). 25th May.—Battle cruisers. The Naval Budget for 1913.

LE YACHT. Paris: 4th May, 1912.—The *mechaniciens* of the navy. 11th May.—Blockade mines and mine layers. 18th May.—The protection of war vessels. 25th May.—Removal of the wreck of the "Liberté." Floating dock for submarines.

LE MONITEUR DE LA FLOTTE. Paris: 4th May, 1912.—The employment of retired officers. Naval aviation. 11th May.—The naval estimates for 1913. 18th May.—Submarine mines. The naval staff. The *Ecole Supérieure de la Marine*. 25th May.—Fighting evolutions. Instructional courses on shore.

GERMANY.

MARINE RUNDSCHAU. Berlin: May, 1912.—The British Naval Budget, 1912-13, and the distribution of the British Fleet. The decline of Dutch sea-power. § Further notes on deviations of the compass owing to fog. Causes of the explosion in the Augsburg-Nürnberg engine factory. Ancient and modern charts. Ozone on warships. The ratification of the Prize Court Agreement. Main armament and underwater protection of battleships. The Turco-Italian War (up to 20th April).

ITALY.

RIVISTA MARITTIMA. Rome: April, 1912.—Lord Charles Beresford's "The Betrayal." Italian Commerce in 1910. The conquest of the Antarctic.

MILITARY.

AUSTRIA-HUNGARY.

STREFFLEURS MILITÄRISCHE ZEITSCHRIFT. Vienna: **April, 1912.**—The march of Davout's corps from the Isar to Vienna. § Umpiring. Italy and Tripoli (notes on the war up to March 25th). Support of the Infantry attack by artillery (a lecture on the Austrian Regulations). The campaign of Ulm, 1805. Progress of foreign armies in 1911 (Germany, Russia). Communications from the School of Musketry. **May, 1912.**—The development of the Austrian Army in the time of the Archduke Charles. Italy and Tripoli (notes on the war up to 25th April). Experiences of umpiring in the French Army. Practice with machine guns on miniature ranges. Artillery projectiles and combined shell. The Russo-Persian conflict (up to 9th April). Progress of foreign armies in 1911 (Servia, Montenegro). Austro-Hungarian military periodicals. Communications of the School of Musketry.

FRANCE.

REVUE MILITAIRE DES ARMÉES ÉTRANGÈRES. Paris: **May, 1912.**—The situation of the Brazilian Army in 1912. The United States Army in 1912. * Aeroplanes and dirigibles in Germany. §

REVUE D'HISTOIRE. Paris: **May, 1912.**—The military achievements of the Revolution.* (Part I. The last war ministers of the monarchy: Choiseul.) The campaign of 1794 in Holland † (investment of Ypres). The Peninsular War, 1807-1813 * (preliminary stages; condition of Spain in 1807). The campaign of 1813 † (operations on the Elbe in March-April). The war of 1870-71, the first army of the Loire (action of Artenay, 10th October). General Roon in 1870 (from his correspondence).

JOURNAL DES SCIENCES MILITAIRES. Paris: **1st May, 1912.**—Aeroplanes at the Russian manoeuvres in Poland (with sketch). The organization of the French Colonial Army.* The proposed reorganization of the French cavalry. † The new *cadre* law and the recruiting service. **15th May.**—The end of a controversy (opposing views on artillery communications). Preparatory military education in England (Boy Scouts, Cadets, etc). General De Brack and his work (author of "Outposts of Light Cavalry," 1833). How to prepare oneself for the *Ecole de Guerre*. Historical study of the laws of discipline in France.

LE SPECTATEUR MILITAIRE. Paris: **1st May, 1912.**—Marching and fighting by night. † The new French cavalry training. Suggested new organization of units * (proposals for increasing efficiency of first line troops). The expedition to Sardinia (Bonaparte at Maddalena, 1792-3). On the Moroccan frontier (1905-6). **15th May.**—Mounted infantry in England. * Suggested new organization of units. † The expedition to Sardinia. On the Moroccan frontier (1906).

REVUE MILITAIRE GÉNÉRALE. Paris: **May, 1912.**—The United States and Japan in the Pacific (the probable situation in case of a war). Evolutions and manoeuvres (a tactical lecture for infantry). The reorganization of the Russian Army (with railway map). Studies of the Russo-Japanese War † (causes of Russia's failures; Japanese national spirit). Napoleon in the field § (Napoleon's conduct on the battlefield).

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GERMANY.

MILITÄR WOCHENBLATT. Berlin: No. 56 of 2nd May, 1912.—Port Arthur, a study of the defence (continued in Nos. 57, 58, 59). The National Aircraft Fund. Notes on the Russian Army (continued in No. 57). No. 57.—Battalion training. Hints for officers criticising artillery practice. No. 58.—Notes on the French Army. No. 59.—The use of search lights (continued in Nos. 60, 61). Tactical employment of howitzer batteries in Russia. No. 60.—Railway troops of various Powers. The British R.A.M.C training. No. 61.—The Turco-Italian War (survey of past seven months). The Official History of the Seven Years' War. No. 62.—Changes in opinions on the use of field artillery. Reorganization of the Moroccan Army. No. 63.—The Bavarian Army List of 1912. The Russian Campaign of 1812 (continued in No. 64). Modern views on the rôle of fortification. Austrian cavalry manœuvres in 1911. No. 64.—Cæsar's strategy (continued in No. 65). The Turco-Italian War (18th April-8th May). No. 65.—The Prussian Army List for 1912. Organization in multiples of three. Interpolation of infantry in artillery columns. Nos. 66/67.—Company inspections. No. 68.—Getting men into marching condition. Will the French reintroduce three-years' service for mounted troops? The systematic encouragement of aeronautics in Germany.

INTERNATIONALE REVUE. Cologne: May, 1912.—Belgium: Autumn manœuvres. Germany: Cavalry in 1911 manœuvres; amendments to Foot Artillery Training; usages of war (appendix to German F. S. R.). France: Reorganization of aeronautical services; Fire control of Field Artillery; new Cavalry Training; night manœuvres. Great Britain: Naval Budget. Italy: Losses in the war. Russia: Training of Reserve officers. French Supplement 158. Gun, powder and ammunition accidents, 1909-1911 (from *Artilleristische Monatshefte*). German Supplement 140.—The renovation of the Russian Navy.

ITALY.

RIVISTA MILITARE ITALIANA. Rome: May, 1912.—Notes on Infantry. * Draught or pack artillery. Events in Ethiopia (with plans; an account of the rebellion in the autumn of 1909 and the battle of Quoram). The German and French Grand Manœuvres of 1911. § The projected new regulations for the Austro-Hungarian Army. † Crime in the army, relative to that among minors. * Some observations made at Aldershot after a visit to the 5th Dragoon Guards. Statistical notes on the levy of youths born in 1889. § Some grave difficulties in military and administrative control experienced by the French in Algeria compared with those of the Italians in Libya. The jubilee and resurrection of the Fatherland. The new Italian territory in Libya. † Reserve cavalry.

UNITED STATES.

JOURNAL OF THE MILITARY SERVICE INSTITUTION OF THE UNITED STATES. Governor's Island, New York: May-June, 1912.—Standing Armies. War Letters of General J. E. Johnston. Military Education of the Youth of the Country. Auto-Intoxication (Seaman Prize Essay). The Peace Movement and the Military Policy of the United States. The Cavalry Regiment. † The Infantry Drill Regulations. Notes on Java and the Philippines. General Wayne's Campaign (1791).

*—to be continued.

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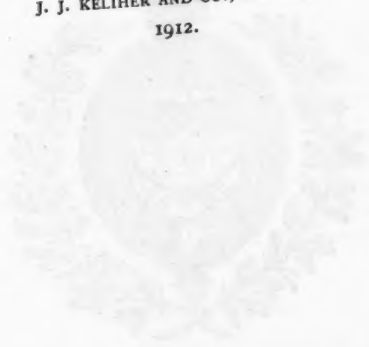
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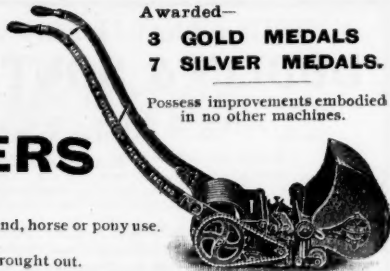
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HISTORY OF THE 7TH (QUEEN'S OWN) HUSSARS

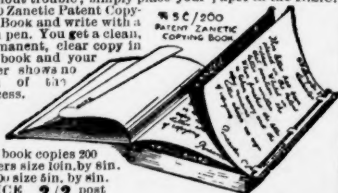
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